The IRON AGE

January 15, 1959 A Chilton Publication The National Metalworking Weekly

New Process Speeds Up Part Finishing P. 79

Will Defense Spending Unbalance Ike's Budget? – P. 41

Steel Banks on Oxygen To Boost '59 Capacity – P. 44

Digest of the Week – P. 2-3

ARISTOLOY

COLD FINISHED BARS

COLD DRAWN BARS
Rounds . . . 1/2" to 3-1/4"
Hexagons . . . 9/16" to 1-11/16"

TURNED BARS
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TURNED AND POLISHED BARS
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TURNED, GROUND AND POLISHED BARS
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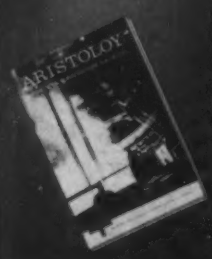

NEW PRODUCTS & FACILITIES CATALOG

Describes melting, rolling, thermal treating and finishing capacity of Copperweld's Aristoloy Steel Division. Complete product listing for Aristoloy carbon, alloy, stainless, leaded and nitriding steels. Send for your copy today.

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COPPERWELD STEEL COMPANY

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January 15, 1959—Vol. 183, No. 3

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*Starred items are digested at right.

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NEWS ARTICLES

IKE'S BUDGET

Defense Spending Could Wreck It—Democratic insistence on more defense spending may blast the Ad-

ministration's hope for a balanced budget. But Ike will fight against what he calls "the spenders." P. 41

OXYGEN AND STEEL

Tonnage Factor—Oxygen steelmaking furnaces are credited with a large part of the rise in U. S. capacity from 140.7 million ingot tons to 147.6 million. They will contribute even more in the future. P. 44

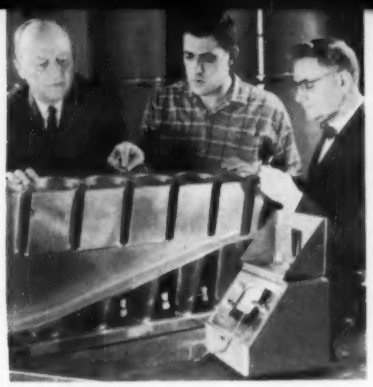
VENEZUELA OUTLOOK

Times Have Changed — Venezuelans are tired of dictators. They're ready to "buy" democracy. It's time to take stock on your business approach to this rich Latin American country. P. 46

TURBINE ENGINE

Chrysler's Progress—In a few years, automakers will be able to

in Metalworking



VIBRATION FINISH: Controlled vibrations have finished interior surfaces of zinc die casting. Checking the finish are officials of the Lord Chemical Co. (left to right): H. R. Stitely, president, C. O. Brandt, supervisor, and W. E. Brandt, vice president. P. 79

choose between piston or turbine engines, Chrysler executive says. Materials and design bottlenecks are being overcome rapidly. P. 57

DEFENSE SPENDING

It Will Climb—Cutting defense costs is easier said than done, say Capital insiders. Congressional pet projects may raise military spending to $42 billion. P. 61

FEATURE ARTICLES

ROTOR BALANCE

On Production Scale — Modern electro-dynamic machines quickly spot unbalance and do away with human error. Featured in one type of balancing machine is an electric device that compensates plane locations no matter how unsymmetrical they are with respect to bearing planes. P. 84

FAST CARBURIZING

What Controls to Use?—Accelerated carburizing at high temperatures was tried out years ago. Today there's growing interest in the process. But carburizing at temperature well above 1700°F poses many problems of control. P. 86

GAGE TUBE LENGTH

With Electronics — Tubes are pushed against a stop. The operator presses a stop against the other end of each tube. On pressing of "record" button, the length of tube is accurately measured and printed on a final tally sheet in the shipping office. P. 89

OPTICAL GAGING

For Blind Surfaces—Two uses for optical comparators are growing rapidly. One is measurement by tracing. The other: High intensity illumination. P. 90

ELECTRIC WELD FOR RAILS

A Low-Cost Method—A rail-welding system may save U. S. railroads millions of dollars annually. It's the first automatic electric rail welding system to be built here. The welded rail can now be installed for less than the cost of the bolted-joint type. P. 92

MARKETS & PRICES

ZINC MARKETS

Cause for Comfort—Zinc producers are encouraged about their market outlook for this year. Galvanized sheet shipments are booming. New auto applications are promising. P. 48

FARWEST BUSINESS

Early Gains Expected — Optimism is the rule, not the exception, in the Farwest. Businessmen there believe this quarter will top either first or last quarter of '58. P. 63

TAPE CONTROLS

A New Entry—A vertical turret lathe introduced by Giddings & Lewis uses tape controls to cut short-run costs. New control allows information to be added to the data system. P. 65

STEEL INVENTORIES

Buildup Lags—Users are taking their time about rebuilding stocks despite the strike danger. Industry observers feel that it may be too little and too late for some if strike comes next summer. P. 113

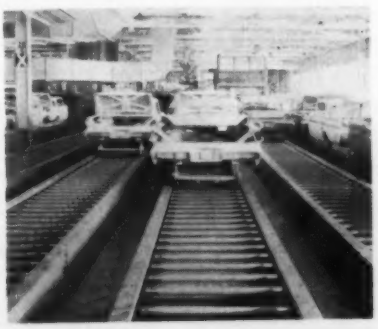
FURNACE PRICES

Probable Rise This Year—Industrial furnace makers are wooing buyers with equipment to modernize and improve heat treating. But they warn that some price hikes look certain during 1959. P. 114

NEXT WEEK

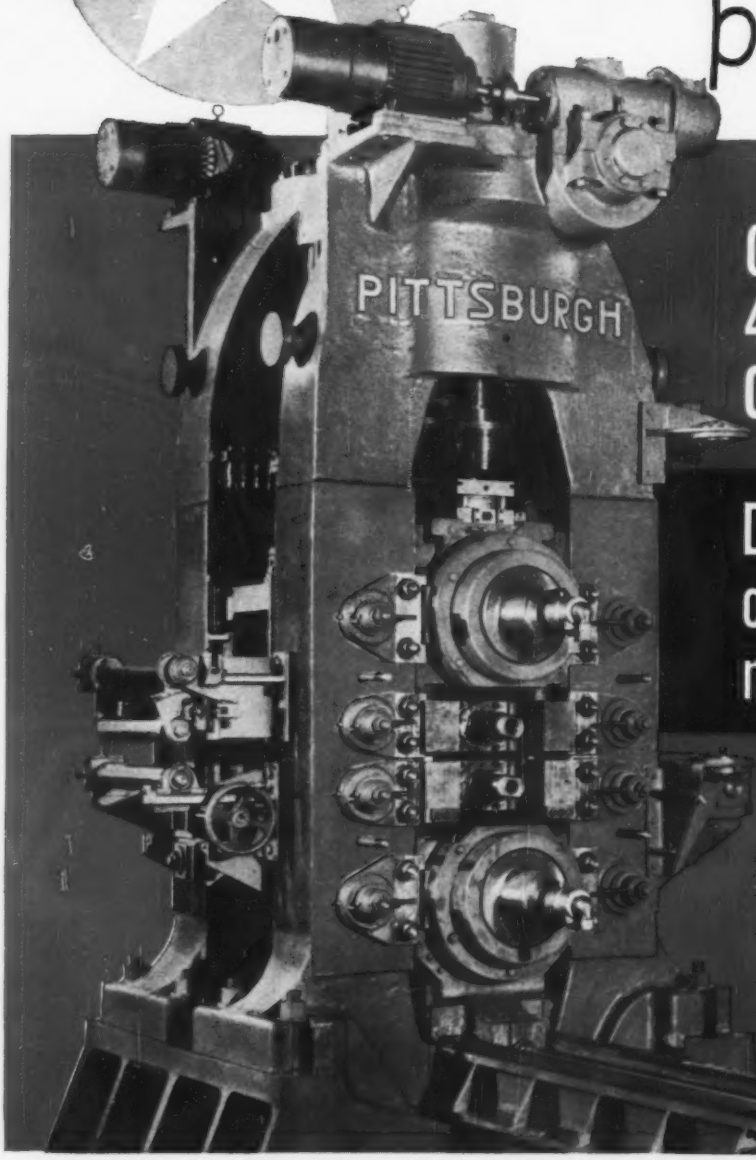
AUTOMOTIVE SUPPLIERS

What's Their Fate?—Auto companies are doing more of their own work. Several makes of cars have been discontinued. Next week, a report from Detroit will analyze the effect the changing automobile industry is having on parts suppliers.



PITTSBURGH

presents—



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Does the work of two separate mills

"Precision" and "Versatility" are the words that best describe the new combination 2 High/4 High Cold Mill designed and built by PITTSBURGH to secure precision gauge, temper and finish for the ferrous and non-ferrous industries. As a 4 High Mill, it is used for cold reducing; as a 2 High Mill, it is used to acquire the desired temper and finish. Several desirable design features are incorporated to keep roll change time to a minimum. Low initial cost and economical operation are attractive plus values.

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Our plant is equipped with a superior complement of well diversified machine tools that are available on a continuing basis for economical machining of heavy castings or the manufacture of auxiliary rolling mill equipment, such as heavy mill tables, furnace pushers, slab depilers, downcoilers, ingot buggies, slab transfers, etc.

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spotlighting

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Previous contact tube design depended entirely on wire cast for limited contact; uncertain current pickup resulted. New-Longitudinal wires, brazed at one end, act as a chuck to insure positive contact.

. . . that dramatically improves the arc stability of your Aircomatic® equipment

Physically, this new contact tube with "floating Chuck" is just a trifle—a simple set of hardfaced "wiping" wires** inserted in the contact tube barrel of your Aircomatic gun. But it gives positive, multiple contact with the welding wire at all times.

It ends interior arcing, prevents burnback, galling, insures good current pickup, increased current capacity and stable arc performance—on Aircomatic welding guns.

The new wiping action contact tube is available in various diameters for the Aircomatic MIGet*, the Aircomatic Pull gun, the Aircomatic push gun (except heavy-duty), and the AMHB **Aircomatic head. Optional equipment on all new guns. For complete information, contact your Airco office.**

Welding wire leaves the barrel through a nest of longitudinal wires. Wiping action assures stable arc performance even with aluminum and magnesium wires.

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New steels are born at Armco

Only Armco Cold-Rolled Steel Specified
For Deep-Drawn G. E. Cleaner Casing

General Electric consistently specifies sheet coils of .032", Armco Cold-Rolled Drawing Quality Special Killed Steel for the deep-drawn top half of the casing on canister-type vacuum cleaner models. These units are produced at G.E.'s Vacuum Cleaner Department, Housewares and Radio Receiver Division, Cleveland, Ohio.

Whether painted or plated, the top half of the casing on every General Electric canister-type vacuum cleaner is fabricated from Armco Cold-Rolled Steel. Here's why, in the words of G.E.'s steel buyer:

"Armco Cold-Rolled performance has proven through trial to be superior through a lower percentage of surface defects plus excellent drawing quality."

Despite the severe draw, rejects are extremely low because of the consistently excellent drawing quality of Armco Cold-Rolled Steel. Superior surface and uniform grain structure minimize defects in painting and plating.

In addition, use of one grade for both painted and plated parts simplifies inventory, while use of steel in coils speeds production.

Special Steels for every need

Cold-rolled is only one of a wide range of Armco Special Steels processed to meet specific product needs. An Armco representative will be happy to consult with you about selection of Armco Steels for your requirements. Just call your nearby Armco Sales Office or write us. Armco Steel Corporation, 1199 Curtis Street, Middletown, Ohio.

ARMCO STEEL

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Who's Union Busting? Certainly Not Management

Before many more moons are out there will be many more accusations that management is trying to bust the unions. Just how true—or untrue—is this?

The number of businessmen who are out to break up organized labor is a small part of the total—if they exist at all.

It may sound like good copy to accuse industrialists of trying to undermine unions. At least it is dramatic—or labor chiefs feel it is. But by now this accusation is an old chestnut.

For years organized labor has been adding to its ranks, to its treasury, and to its power. It would be impossible for business to bust the union movement—even if it wanted to.

Our government — far from busting any unions—has gone out of its way to protect them. Even Congress with its searching hearings on less responsible unions is loath to pass any restrictive laws affecting organized labor. There is little chance it will do so soon.

Certainly the great mass of unorganized workers — who far outnumber those who are organized—have no desire to bust the unions. Some may feel they are getting the short end of the stick because of organized labor's monopoly of power. But they want no part in breaking it up—not yet anyway.

They say that power corrupts in the sense that responsibility flies out the window. The time may not be too far away when organized labor may see that it has misused the trust, the power, and the force which it has developed; thanks to the government, strikes, its own work —and management's weak position.

When that day comes it might be a bad day for all labor. The pendulum never swings entirely with logic or with understanding.

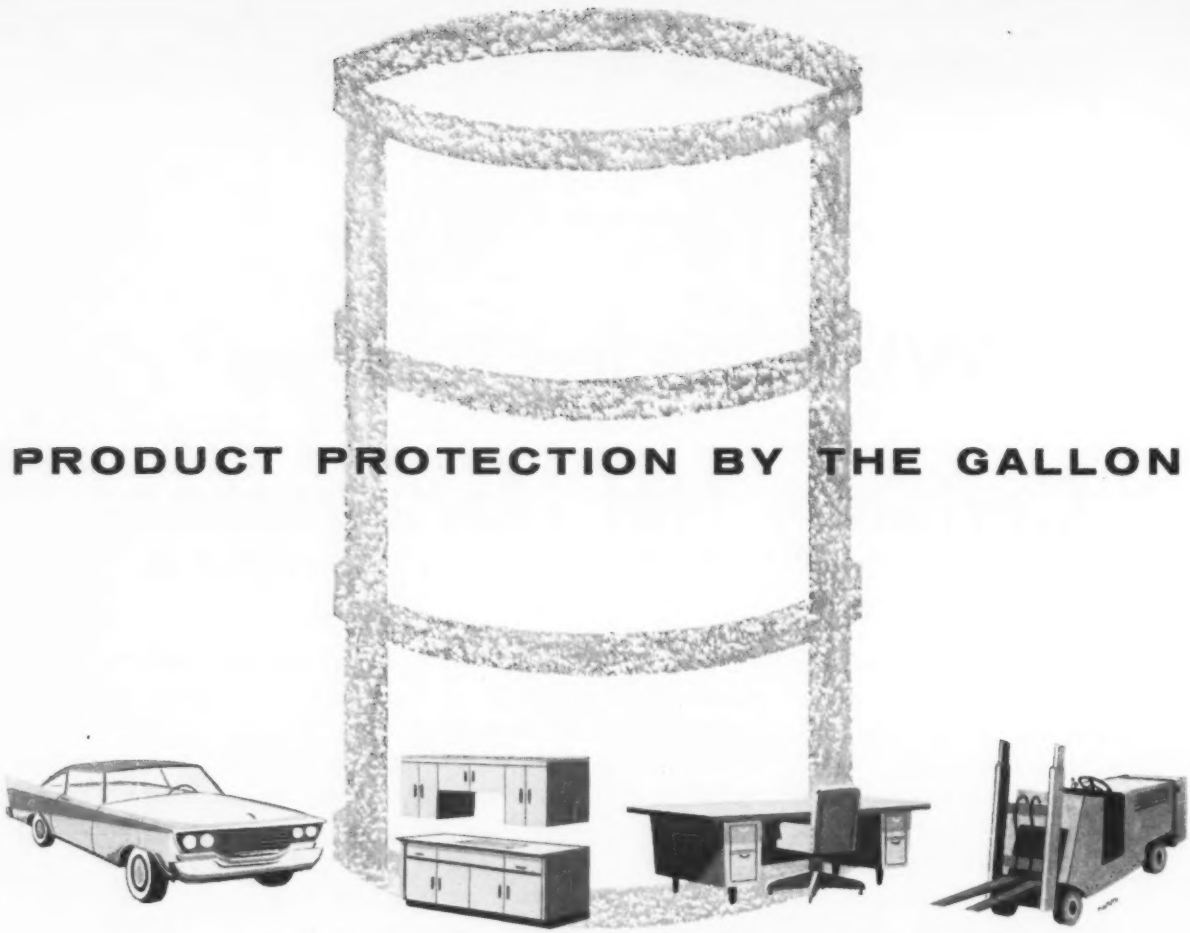
This may be labor's year of responsibility—as well as management's. This may be the year when some labor chiefs ought to decide to be labor statesmen. If that is asking too much, maybe they should stop demanding the moon. It might surprise some union chiefs that management is much more reasonable, responsible, and fairer than either labor or some Congressmen believe it to be.

If anyone is going to bust unions, it will be the unions themselves or their leaders who will do it—certainly not management.

Tom Campbell

Editor-in-Chief

PRODUCT PROTECTION BY THE GALLON

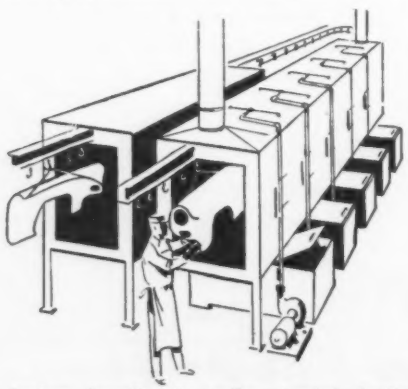


WITH AMCHEM GRANODINE!

One of the most widely used metal finishing chemicals, Amchem Granodine is the most effective pre-paint treatment yet developed for the protection of fabricated steel products.

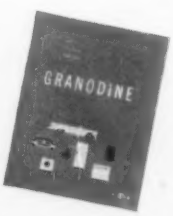
The non-metallic phosphate coating produced by Amchem Granodine provides an effective base for durable paint finishing and greatly improves the corrosion resistance of the finished product. A variety of Granodizing processes are available for a wide range of finishing operations . . . to assure your products of greater usability through lasting protection.

It may be well worth your while to investigate cost saving, efficient Amchem Granodine—today's most modern metal finishing chemical for steel. Check Amchem where service goes beyond the product with a complete program of technical and engineering assistance!



Granodizing process may be applied by power spray (shown on left), dip system or by hand application.

Write for Bulletin 1380 with Selection Chart to help you choose the Granodine type for your specific needs—and bulletins featuring other Amchem chemicals of vital interest to the fabricator of steel products.



AMCHEM AMCHEM GRANODINE

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Watch Retained Austenite

What endows certain high-strength steels with better fatigue strength? Usually such factors as surface condition and metal cleanliness are listed. These count. But a highly critical factor—retained austenite—is often overlooked. Austenite transformed under stress produces untempered martensite which lowers fatigue life. So for best fatigue strength, advises a recent report, look to those steels least prone to austenite retention.

Simplify Stress Analysis

Casting of models in epoxy resin has simplified use of three-dimensional photo-elasticity in complex shapes such as valves. The resin model is heated to critical temperature, loaded, and then slowly cooled with loads still acting. Strains are locked in the model. Slices taken can be examined in polarized light for computing of stresses.

Test Man-in-Space Plane

First drop test of the X-15 rocket plane is due late this month or early February. Airworthiness will be tested in drop from a B-52 bomber. Weather variables prevent fixing a precise date. First powered flights are a few months away.

Steel, Auto Probes Wait

The Senate antitrust subcommittee will sit tight on its steel and auto industry probes. "We want to see how prices in these industries develop this year," one insider says. At the first sign of an "administered price" boost, however, the subcommittee expects to leap into battle again. Subcommittee chairman Estes Kefauver wants to let industry make the first move this time.

TV for Noisy Applications

Designed to resist sound levels that would shatter the hearing of a human, a TV camera operates at noise levels up to ±145 db without an acoustical housing. With a housing, it can stand virtually any noise level and has been used in levels above 190 db. Immediate application is on rocket or jet engine test stands. The unit, designed for closed-circuit systems, weighs only 7 lb.

Boost in Bearing Size

Anti-friction bearings of 165-in. diam are now a reality. Developed for radar installations, they're expected to find commercial uses such as in large numerically-controlled machine tools. Engineers predict precision ball and roller bearings will go beyond the 100-ft limitation in a few years.

Annealing Is O.K., But—

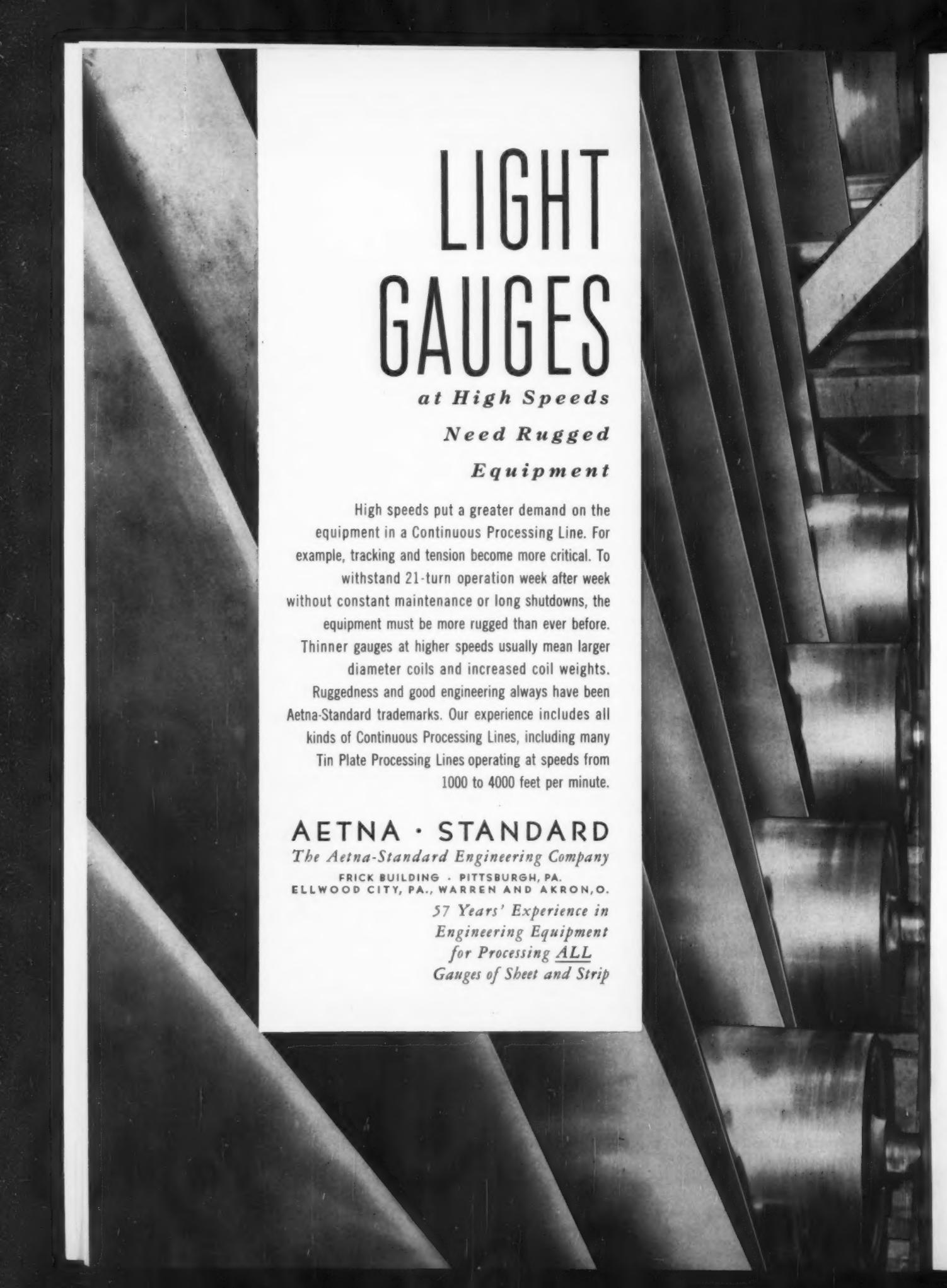
Annealing has for years been the conventional answer to relieving all types of stresses in steels. Machining stresses, in particular, have been assumed to disappear just as soon as a part is suitably annealed. Latest research casts doubt on the usual "cure all." Many surface conditions involve types of crystal-lattice distortion that aren't touched by annealing—even at very high temperatures.

More Argon for Steelmaking

Increased use of argon in conventional electric and vacuum melting furnaces should continue. Construction of tonnage oxygen for plants is making argon easily available to steel mills. The gas can be passed through hollow furnace electrodes. It forms a blanket that protects steel from the atmosphere and retards nitrogen absorption.

Check White-Collar Work

Interest in applying shop productivity measurements to white-collar workers is gaining ground rapidly. One management consulting firm reports a backlog of 50 inquiries on the cost of white-collar efficiency studies. Earlier data had already indicated that the average white-collar force operates at about 30-35 pct efficiency as compared with 80-pct efficiency for the production worker.



LIGHT GAUGES

at High Speeds

Need Rugged

Equipment

High speeds put a greater demand on the equipment in a Continuous Processing Line. For example, tracking and tension become more critical. To withstand 21-turn operation week after week without constant maintenance or long shutdowns, the equipment must be more rugged than ever before. Thinner gauges at higher speeds usually mean larger diameter coils and increased coil weights. Ruggedness and good engineering always have been Aetna-Standard trademarks. Our experience includes all kinds of Continuous Processing Lines, including many Tin Plate Processing Lines operating at speeds from 1000 to 4000 feet per minute.

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Capital Spending

Sir—I would appreciate receiving fifteen copies of the special report, "Metalworking Capital Appropriations" which appeared in your November 27, 1958, issue. Trank you. —R. W. V. Bunt, Market Planning Mgr., Central Region, Westinghouse Electric Corp., Pittsburgh.

Sir—We would appreciate receiving your quarterly survey of metalworking capital appropriations covering 36 industries.—D. H. McKee, McKee-Kenyon & Co., Detroit.

Sir—Will you please furnish us two reprints of "Metalworking Capital Appropriations."—M. J. Terman, Sales Mgr., Refractories Div., The Babcock & Wilcox Co., New York.

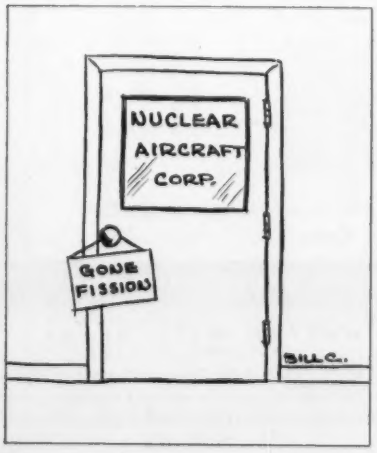
Michigan Industry

Sir—The article "Why Industry Shuns Michigan" in your December 18 issue should be read by our two senators, our governor, labor leaders, and by the members of the recently appointed Governor's Committee to Investigate Business Conditions in Michigan.

It is only by seeking the truth and putting the 'spotlight of publicity' on wrong-doing that those interested in Michigan's industrial future can hope for improvement.

Are any reprints available?—W. F. Horsch, General Mgr., William F. Horsch Co., Grosse Pointe, Mich.

▪ Reprints are available and will be sent.



Business Gifts

Sir—Please accept my heartiest congratulations on your editorial "Business Gifts: Are They on the Way Out?" appearing in the December 18 issue. It is timely, significant, and very well written.

When will managers realize that the cost of Christmas gifts to their employees from vendors is included in the price of the item they are buying from such vendors?

I believe more on this subject would eliminate management's timidity regarding this practice which has no relation to the spirit of Christmas. — J. W. Considine, Sec'y-Treas., Gar Wood Industries, Inc., Wayne, Mich.

Standards

Sir—Please send me ten copies of the article "Standards Improve Efficiency" which appeared in the December 18 issue.—A. J. Raymo, Factory Mgr., Baldwin-Lima-Hamilton Corp., Eddystone Div., Phila.

Vanishing Pride

Sir—Your Nov. 6 editorial—"Pride of Workmanship—What Has Happened to It?"—was a fine job. We are requesting permission to reprint it in an issue of "Synopsis," our plant newspaper.—G. A. Taylor Employee Relations Supt., Ind. Rel. Dept., U. S. Naval Ordnance Plant, York, Pa.

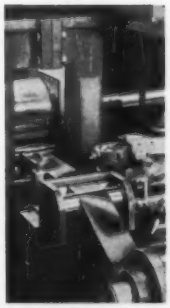
IT'S NOT
"HOW THIN"

→ 0/8

BUT
HOW EXACT!

With the recent trend in strip metal towards thinner and thinner gauges, Somers, a pioneer in thin strip for nearly 50 years, is naturally among the leaders in rolling *ultra-thin* strip. But in addition to rolling production quantities of strip as thin as can be obtained anywhere in the world, Somers utilizes exclusive techniques and equipment to make sure that every foot of metal is up to the most exacting standards.

1. Accu-Ray nuclear gauging to assure absolute uniformity of thickness throughout.



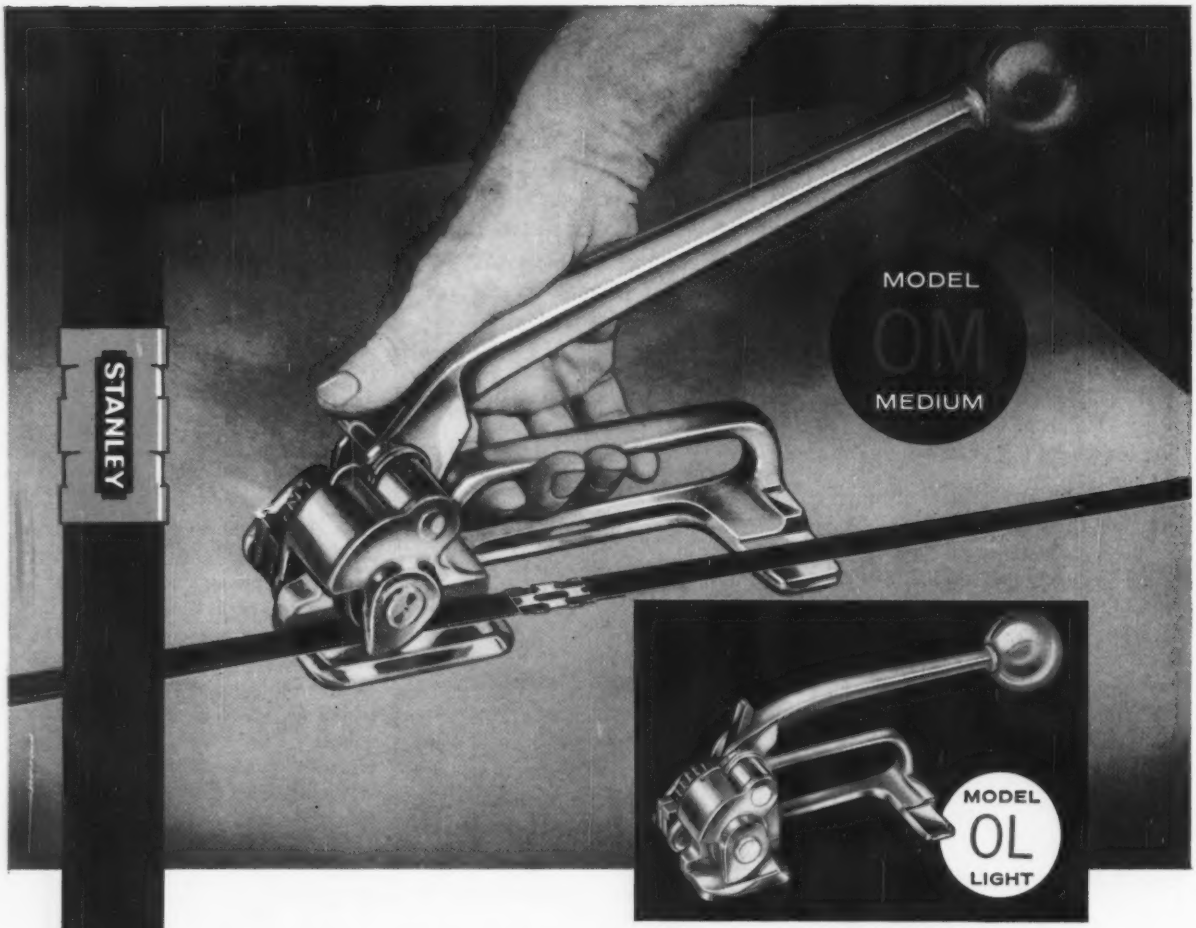
2. Unique rolling mill for strip from .001" down, makes possible extremely close control of the final preanneal temper, and uniform accuracy of the final temper.

NEARLY
FIFTY
YEARS

3. Experience exclusively with thin strip metals gives Somers an unmatched background in engineering *ultra-thin* strip to meet all special requirements.

FOR EXACTING STANDARDS ONLY
Somers

Somers Brass Company, Inc.
102 BALDWIN AVE., WATERBURY, CONN.



NEW STANLEY TIGHTENERS

Versatile...Lightweight...Sturdy–

The Stanley O Tightener sets a new standard of efficiency for tensioning steel strapping to the required maximum with a manually-operated steel strapping tool with unlimited take-up.

The O Tightener is versatile . . . used to steel strap packages of varying sizes, shapes and weights. Operates with equal ease and speed in any position. Easy to handle, and requiring fewer strokes for take-up, it reduces operator fatigue and saves time. It's a strap-saver too! Applying seals behind tensioning wheel cuts overlap to minimum required for maximum joint security. Tightening action is more positive because there are *two* holding pawls on tensioning wheel. Removal from strapping is instantaneous. The operator returns tightening lever to down position and slides tool from strapping.

FEATURES

- **Insertion, alignment of strapping is easy, quick.**
- **Light weight and balance assure handling ease.**
- **Sturdy construction means long life.**
- **Has unlimited take-up.**
- **Seals may be applied in front of or behind tensioning wheel.**

MODEL OL 3	3/8" STRAP
OL 4	1/2"
OL 5	5/8"
MODEL OM 5	5/8" STRAP
OM 6	3/4"

For more information, write STANLEY STEEL STRAPPING, Division of The Stanley Works,
Dept. A, 1317 Corbin Ave., New Britain, Conn.

STANLEY INSURE IT – SECURE IT WITH STANLEY STEEL STRAPPING

AMERICA BUILDS BETTER AND LIVES BETTER WITH STANLEY

STANLEY

This famous trademark distinguishes over 20,000 quality products of The Stanley Works—hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • stampings • springs • coatings • strip steel • steel strapping—made in 21 plants in the United States, Canada, England and Germany.

Taste Treat

We're grateful to H. C. McDaniel of Westinghouse for this item which appeared in Charley Danver's column in the Pittsburgh Post Gazette:

"For Gourmets—Sam Heppenstall gave a holiday dinner at the Chariot. The menu listed such delicacies as Alloy Castings in the Half Shell, Broiled Double Connecting Rods with Mint Jelly, French Fried Blast Furnace Rings and, for dessert, Vanilla Minecar Wheels with Burnside Sauce.

Harry Zamsky, co-owner of the place, says he wouldn't be surprised if they got a Gourmet Award from IRON AGE Magazine."

Consider it awarded, Mr. H! The IRON AGE Gourmet Award with refractory cluster.

Puzzler

All possible answers seem to be in now for the plane-encircling-the-globe puzzler. The majority view: It would take three airplanes to encircle the globe under the conditions specified. We've been running around in circles with this one, but it sort of works out like this:

If an airplane starts out from the Air Force base and is refueled by another plane when it reaches ¼ the circumference of the earth, it will then have enough fuel to cover ¾ of the earth. If another plane starts from the other end to meet it and refueling occurs, the first plane will then be able to complete the trip.

The ones who agree: Norbert J. Mayer and Mrs. Kathleen Wollin, Great Western Steel Co.; H. L. Tomlinson, N. Uzelac and D. W. Garrett, The Budd Co.; Charley Ward, American School; Jim Mull, The North American Manufacturing Co.; Lou Wolff, American Nickel Alloy Manufacturing Corp.; La. A. Eckland, Veeder-Root, Inc.; D. Birkin, Brooklyn, N. Y.; and Fred Barker, Republic Steel Corp.

Those who do not agree: E. F. Wraga, American Can Co. and Arnold Hanson, Jr., Amay Steel Co.

感謝状

メスタ・マシン・カンパニイ殿

貴社は当社千葉製鉄所ストリップ工場建設に当り綿密なる計画と卓越せる技術を以つて機械装置の製作に努力せられ枉めて優秀なる成果を挙げられました

茲に同工場竣工披露式に際し謹んで感謝の意を表します

昭和三十三年十一月八日

川崎製鉄株式会社

取締役社長 西山彌太郎

CONGRATULATIONS: That's what it says. And in case your Japanese is a trifle rusty, we'll add it's from the Kawasaki Steel Corp., Kobe to Mesta Machine Co. It conveys thanks for the help Mesta gave in engineering and constructing a new strip mill.

IN A SQUEEZE?

HERE'S YOUR ANSWER

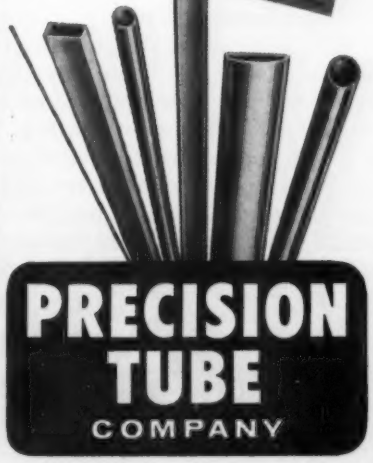
FOR PRECISION TUBING AT REGULAR TUBE PRICES

Quality specifications and profit margins have you in a squeeze on tubing? Precision Tubing assures you unsurpassed quality of temper, straightness, accuracy, finish and roundness at regular mill prices . . . and test results prove it.

Whatever the type of alloy tubing you need from .010" to 1.125" O.D. in copper, brass, aluminum, up to ⅝" O.D. in nickel and nickel alloys, Ni-Span "C", phosphor-bronze and nickel silver Precision can supply it. Whether you need Bourdon, round, rectangular, oval or square . . . preformed to special shapes . . . or Coaxitube-Precision can supply it to your specifications.

For improved quality at lower costs specify Precision Tubing. Write for technical data to Dept. 10, Precision Tube Company, Inc., North Wales, Pa.

GET THIS NEW TUBING DATA CATALOG . . . FREE!



PRECISION TUBE COMPANY

With Harbison-Walker Refractories

LONGER SERVICE and INCREASED TONNAGE in the ALL-BASIC open hearth

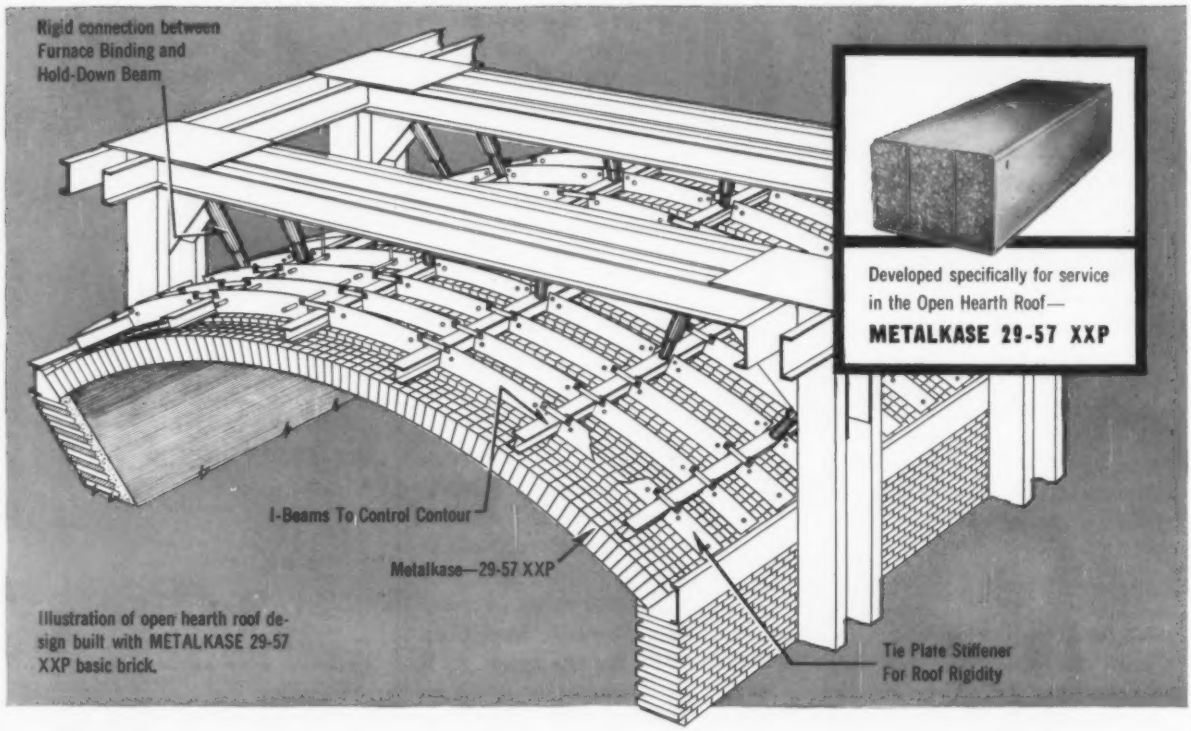

Rigid connection between Furnace Binding and Hold-Down Beam
I-Beams To Control Contour
Metalkase—29-57 XXP
Tie Plate Stiffener For Roof Rigidity
Developed specifically for service in the Open Hearth Roof—
METALKASE 29-57 XXP

Illustration of open hearth roof design built with METALKASE 29-57 XXP basic brick.

Accelerated progress in open hearth steel furnace practice involving larger furnaces, increased use of oxygen and higher rates of production creates demands for superior refractories. With the all-basic open hearth furnace becoming an economical reality, the development of new refractories having decidedly enhanced properties has been necessary. Harbison-Walker conventional and specialized basic refractories are meeting these requirements and winning widest approval.

A fundamental development in the achievement of the all-basic furnace is the metal encased basic brick pioneered more than forty years ago by Harbison-Walker. Through constant research and extensive application experience, rapid evolutionary progress has resulted in the successful use of the metal encased basic brick for open hearth roofs, as well as for other furnace parts.

METALKASE 29-57 XXP internally plated metal encased basic brick is used in both sprung and suspended open hearth roof constructions of all designs with unmatched service records. An exceedingly important contributor to the excellence of this refractory, developed specifically for the purpose, is the high purity magnesia produced by Harbison-Walker from Michigan brines. Fully stabilized as periclase of high density, it is an important constituent of this refractory having outstanding properties for the particular application.

The successful use of basic brick for roofs contributes to greater severity of conditions imposed upon other furnace parts. Harbison-Walker basic refractory products long established with excellent records, together with the newer specialized brands fulfill these rigid requirements for bottoms—walls—and regenerator checkers and make **THE ALL-INCLUSIVE, ALL-BASIC** Open Hearth Steel Furnace a reality.

HARBISON-WALKER REFRACTORIES COMPANY
AND SUBSIDIARIES — GENERAL OFFICES: PITTSBURGH 22, PA.
World's Most Complete Refractories Service

COMING EXHIBITS

Plant Maintenance & Engineering Show — Jan. 26-29, Public Auditorium, Cleveland. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

International Heating and Air Conditioning Show—Jan. 26-29, Convention Hall, Philadelphia. (International Exposition Co., 480 Lexington Ave., New York 17.)

Western Metal Show — March 16-20, Pan-Pacific Auditorium and Ambassador Hotel, Los Angeles. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Corrosion Show — March 16-20, Chicago. (National Assn. of Corrosion Engineers, 1061 M & M Bldg., Houston 2, Texas.)

1959 Nuclear Congress—Apr. 5-9, Cleveland Auditorium, Cleveland. (Engineers Joint Council, 29 W. 39th St., New York 18.)

Engineered Castings Show — Apr. 13-17, Sherman and Morrison Hotels, Chicago. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Packaging Exposition—Apr. 13-17, International Amphitheatre, Chicago. (American Management Assn., 1515 Broadway, New York 36.)

Powder Metallurgy Show — Apr. 20-22, Sheraton-Cadillac Hotel, Detroit. (Metal Powder Industries Federation, 130 W. 42nd St., New York 36.)

Industrial Finishing Show — June 15-19, Detroit Artillery Armory, Detroit. (Information: H. J. McAleer, 3171 Bellevue, Detroit 7, Mich.)

MEETINGS

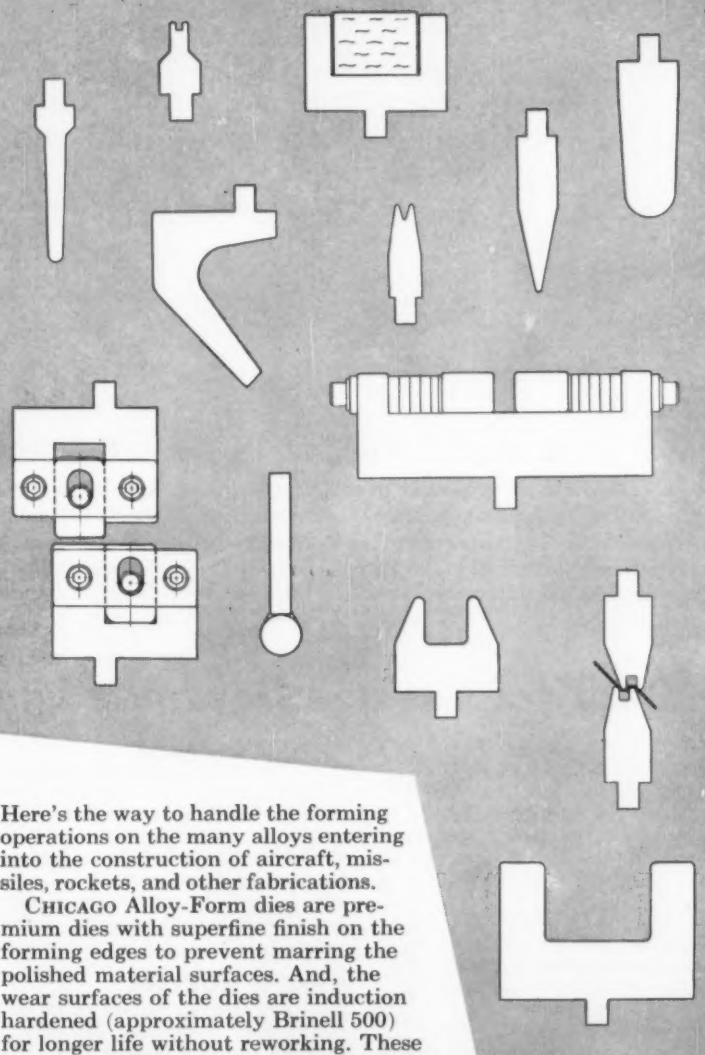
JANUARY

Industrial Heating Equipment Assn., Inc.—Annual winter meet-

(Continued on P. 16)

Alloy Forming for
AIRCRAFT
MISSILES
ROCKETS
and
OTHER FABRICATIONS

CHICAGO®
ALLOY-FORM DIES
For All Makes of Press Brakes



Here's the way to handle the forming operations on the many alloys entering into the construction of aircraft, missiles, rockets, and other fabrications.

CHICAGO Alloy-Form dies are premium dies with superfine finish on the forming edges to prevent marring the polished material surfaces. And, the wear surfaces of the dies are induction hardened (approximately Brinell 500) for longer life without reworking. These dies will fit any make of press brake.

Illustrated are a few of the commonly used types available for prompt delivery. For further data ask for Bulletin AFD-958.

Complete recommendations and quotations on Alloy-Form dies or any special die upon request.

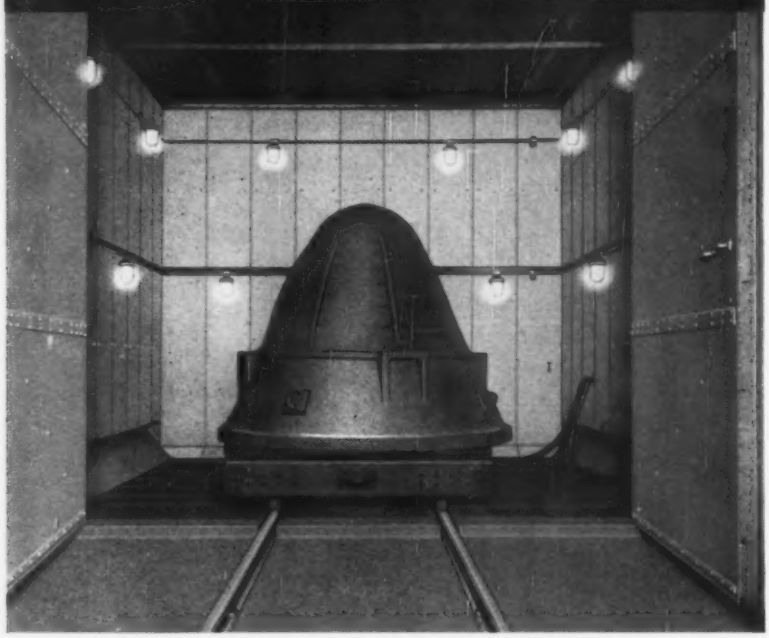
8706

CHICAGO DREIS & KRUMP

DREIS & KRUMP MANUFACTURING CO.
7430 S. Loomis Blvd., Chicago 36, Illinois

Press Brakes • Press Brake Dies • Straight-Side-Type Presses
Hand and Power Bending Brakes • Special Metal-Forming Machines

SLY BLAST ROOMS



Complete, low-cost cleaning of castings, forgings, weldments, tanks, transportation equipment, structural parts is assured. Air blast cleaning exposes defects, saves machine tools, makes paint adhere. Rugged, thoroughly ventilated, Sly Blast Rooms are built in all types and sizes, with fully automatic abrasive handling systems. Work can be handled on monorail or car.

See SLY for Savings Down the Line

DUST CONTROL SYSTEMS
Unequaled experience in system design plus the most extensive dust filter line. *Dynaclone* and *Automatic-Continuous* for uninterrupted, 24-hour-a-day service. *Intermittent* for non-continuous applications. Plus *"Unit"* and *"Economy"* filters.

INDUSTRIAL OVENS
Conveyorized and batch type for better results and increased savings on all baking, drying, finishing, and aging applications.

ROD BAKERS
Pit type in complete range of sizes. Reduce drying time of lime-coated rods from 30 minutes to 5. Designed to save space and coil handling time.

TUMBLING MILLS
Continuous and batch type. Remove fins as they clean castings — saving hours of machining.

BLAST ROOMS
In all types and sizes, with full mechanical return of abrasives. Thoroughly ventilated. Built to withstand years of heavy use.

PURAIR HELMETS
Complete protection against even the finest dust. Lightweight, comfortable. Maximum visibility, complete freedom of head movement.

UNIFLO NOZZLES
Steel with tungsten carbide orifice lining outlasts hard iron nozzles 200 to 1. For shot, grit and sand blasting.

PLUS . . .
Wear-resistant "Slyblast" hose. "Purair" blower units. Air pressure regulators. Abrasive elevating and cleaning units. Pressure blast tanks. Blast cabinets. Tilted blast mills. Gloves, aprons, canvas suits, leggings.

SINCE 1875 SLY

SEND FOR CATALOG describing complete line.

THE W. W. SLY MANUFACTURING CO.

4730 TRAIN AVENUE • CLEVELAND 1, OHIO
OFFICES IN PRINCIPAL CITIES

OVERSEAS LICENSEE: ANDREW AIR CONDITIONING LTD., LONDON S.W. 1, ENGLAND

EXHIBITS, MEETINGS

(Continued from P. 15)

ing, Jan. 19-20, Cleveland. Society headquarters, 1145 19th St., N. W. Washington 6, D. C.

Steel Kitchen Cabinet Mfrs. Assn. —Winter meeting, Jan. 20, Blackstone Hotel, Chicago. Association headquarters, 1008 Engineers Bldg., Cleveland.

Steel Shipping Container Institute, Inc.—Winter meeting, Jan. 20-21, St. Regis Hotel, New York. Society headquarters, 600 Fifth Ave., New York 20.

The American Boiler Mfrs. Assn. — Mid-winter meeting, Jan. 22, Statler Hotel, Cleveland. Society headquarters, 4062 Mayfield Rd., Cleveland 21.

Hoist Manufacturers Assn. — Annual meeting, Jan. 22, Palm Beach Biltmore, Palm Beach, Fla. Association headquarters, One Thomas Circle, Washington 5, D. C.

Institute of Surplus Dealers — 9th annual trade show, Jan. 25-28, New York Trade Show Bldg., New York. Institute headquarters, 700 Eighth Ave., New York.

Truck Trailer Manufacturers Assn. —Annual convention, Jan. 26-28, Hollywood Beach Hotel, Hollywood, Fla. Association headquarters, 710 Albee Bldg., Washington 5, D. C.

Society of Plastic Engineers, Inc.— Annual technical conference, Jan. 27-30. Hotel Commodore, New York. Society headquarters, 65 Prospect St., Stamford, Conn.

Association of Roller & Silent Chain Manufacturers — Annual meeting, Jan. 28-29, Drake Hotel, Chicago. Association headquarters, 3343 Central Ave., Indianapolis.

Easy Portability for Complete Flexibility

The New

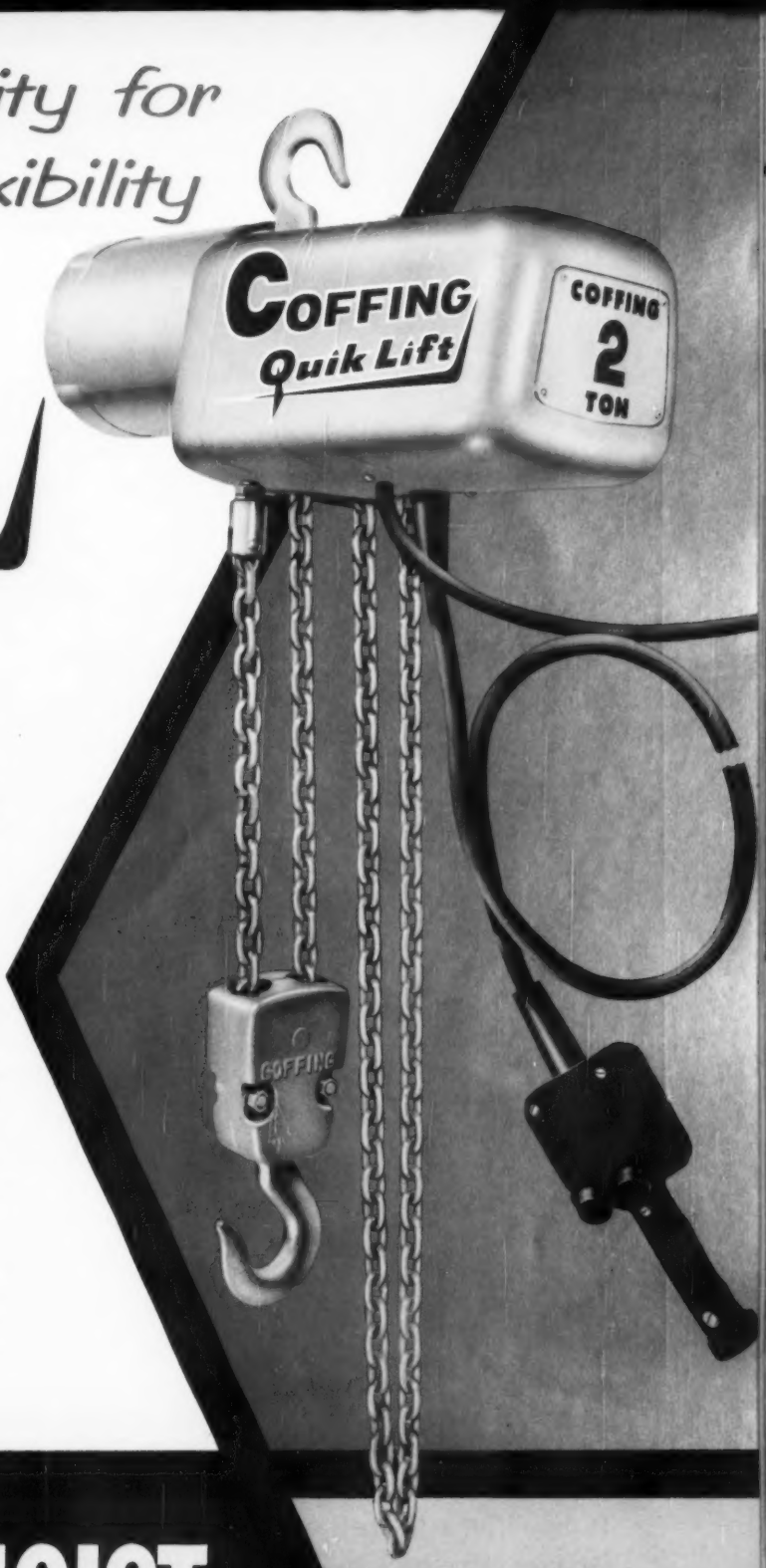
COFFING Quik Lift

COIL CHAIN ELECTRIC HOIST

The completely new Coffing Quik-Lift coil chain electric hoist is designed to give complete flexibility of use. No longer need your electric hoists be considered parts of the building.

Use of a die-cast aluminum housing reduces hoist weight without any loss of strength or durability, making the hoist easily portable. Voltage changes may be made by changing just seven quick connect terminals on the easily accessible terminal block. Converting from single to double chain lifting, rechaining, or converting from hook to lug suspension is accomplished by removing three bolts and shifting or replacing the suspension unit. Adjusting the limit switch for a new lift can be done quickly by moving two nylon nuts to the correct positions.

If you are interested in achieving flexibility in your hoisting operations, investigate the new Coffing Quik-Lift. Your distributor will be glad to give you complete details, or write for bulletin ADH-65.



COFFING HOIST

- Capacities ¼ to 2 Tons
- Interlocked Push-Button Controls
- Lightweight for Easy Portability
- Convenient Operation
- Accessibility

DUFF-NORTON

"Not for me, thanks! It doesn't feel solid . . . like BRASS"

The buying public simply was *not buying* a lock made of a lightweight metal. *Reason:* It didn't have the heft of the good solid Brass they were used to. *Result:* The manufacturer came back to Brass. And then his customers came back, too.

Brass has it . . . what the customers want. And Bristol Brass has what the manufacturers want . . . consistent top quality.

The **BRISTOL BRASS**
CORPORATION

Since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse

AND FOR BRASS FORGINGS, TOO . . . ACCURATE BRASS CORP. (SUBSIDIARY OF THE BRISTOL BRASS CORP.), BRISTOL, CONNECTICUT.

IT PAYS TO STANDARDIZE ON

Stanscrew service helps insure quality for new Tuthill pump

Marvin Williams, Works Manager, Tuthill Pump Company, says: "Dependable, precision-built fasteners are an essential ingredient of the quality we build into Tuthill Pumps.

"Therefore, when we designed our new series of high pressure Powermax pumps, we had our distributor arrange for a visit from Stanscrew's fastener specialist. The socket head cap screws he recommended for this demanding application met the stringent standards we have established. And because of our years of experience with Stanscrew, we know we can count on precise product uniformity and fast service."

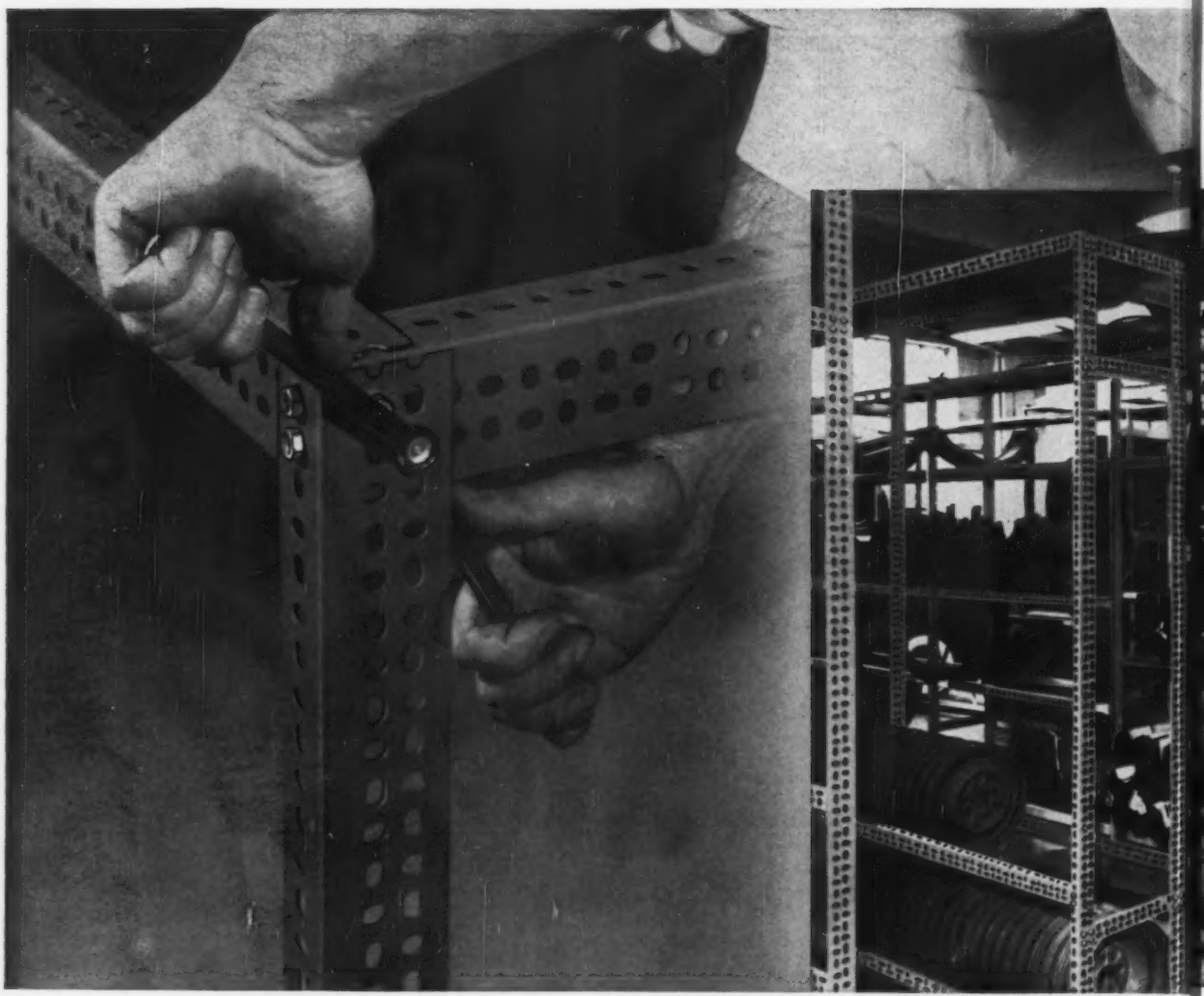
Hundreds of other leading companies in American industry have also learned that it pays to standardize on Stanscrew. For Stanscrew offers a comprehensive line of over 4,000 different types and sizes of standard fasteners . . . including a complete selection of socket, set, and cap screws. These are produced in three modern plants by fastener specialists with over 85 years of specialized experience. All 4,000 items are always in stock . . . quickly available.

When you have a fastener problem, call your Stanscrew distributor. He will arrange for a prompt visit from the Stanscrew fastener specialist. The specific recommendations he will make can often mean important savings.

STANSCREW FASTENERS

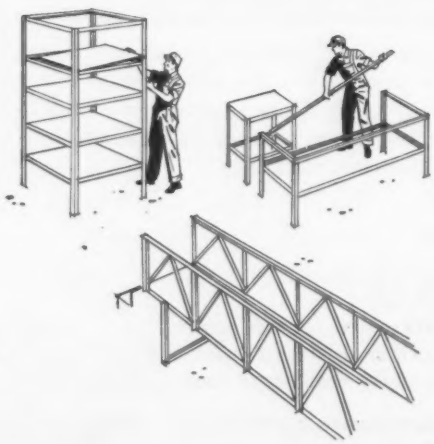
CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

STANDARD SCREW COMPANY 2701 Washington Boulevard, Bellwood, Illinois



REPUBLIC METAL LUMBER

...new building material meets every framing need



Now . . . new building material made of steel with all the framing erection conveniences of common lumber. Republic's new slotted-angle METAL LUMBER is unlimited in application.

Secret is the precision-engineered system of short slots placed to allow ¼″ vertical and horizontal adjustment for utmost flexibility in meeting design requirements. Two-way short-slot pattern provides sufficient bolts in bearing to assure adequate joint strength. Easy to use—simply measure, cut, assemble.

Republic METAL LUMBER® is Bonderized, finished with baked enamel after fabrication for greater resistance to rust and damage. Delivered in easy-to-handle bundles of 10 angles, .080 gage or .104 gage, 10- or 12-foot lengths, hardware included. Stores in same space as one 2″ x 4″ piece of lumber.

Save time, space, and money in building storage racks, catwalks, supports, guard rails, special purpose tables, facilities. Call your Republic representative or write for idea-packed catalog.

MORE REPUBLIC STORAGE AND MATERIALS HANDLING PRODUCTS THAT SAVE MANUFACTURERS AND FABRICATORS TIME AND MONEY...

REPUBLIC WEDGE-LOCK LONG PARTS STORAGE UNITS are easy to load, unload from either side. The heavier the load, the tighter the grip because Wedge-Lock construction includes the three prime essentials of good shelving: 1. A post that will not bend; 2. A reinforced shelf that does not sag; 3. A concealed sway-proof joint. Republic Storage Engineering specialists help you plan. Write today.

REPUBLIC MATERIALS HANDLING SPECIALISTS engineered these steel boxes to the requirements of the Kropp Forge Company, Chicago, Illinois. Special features include corrugated construction for strength, smooth channel around the top to eliminate sharp edges, four-way fork channels to simplify handling, and stacking brackets to permit tiering to any practical height. For materials handling ideas that save space, time, and money, call Republic or send coupon.

TRUSCON "BUDGET BUILDINGS"... 3-WEEK DELIVERY from order to job-site! Here's top utility at lowest cost—the fast, easy way to provide industrial housing or to enlarge manufacturing facilities. Truscon "Budget Buildings" are available in widths of 32, 36, 40, 44, and 48 feet—12- and 14-foot heights, in any length necessary. Roofing, siding, windows, doors, hardware shipped as a package. Erection is fast, easy. Send for brochure.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
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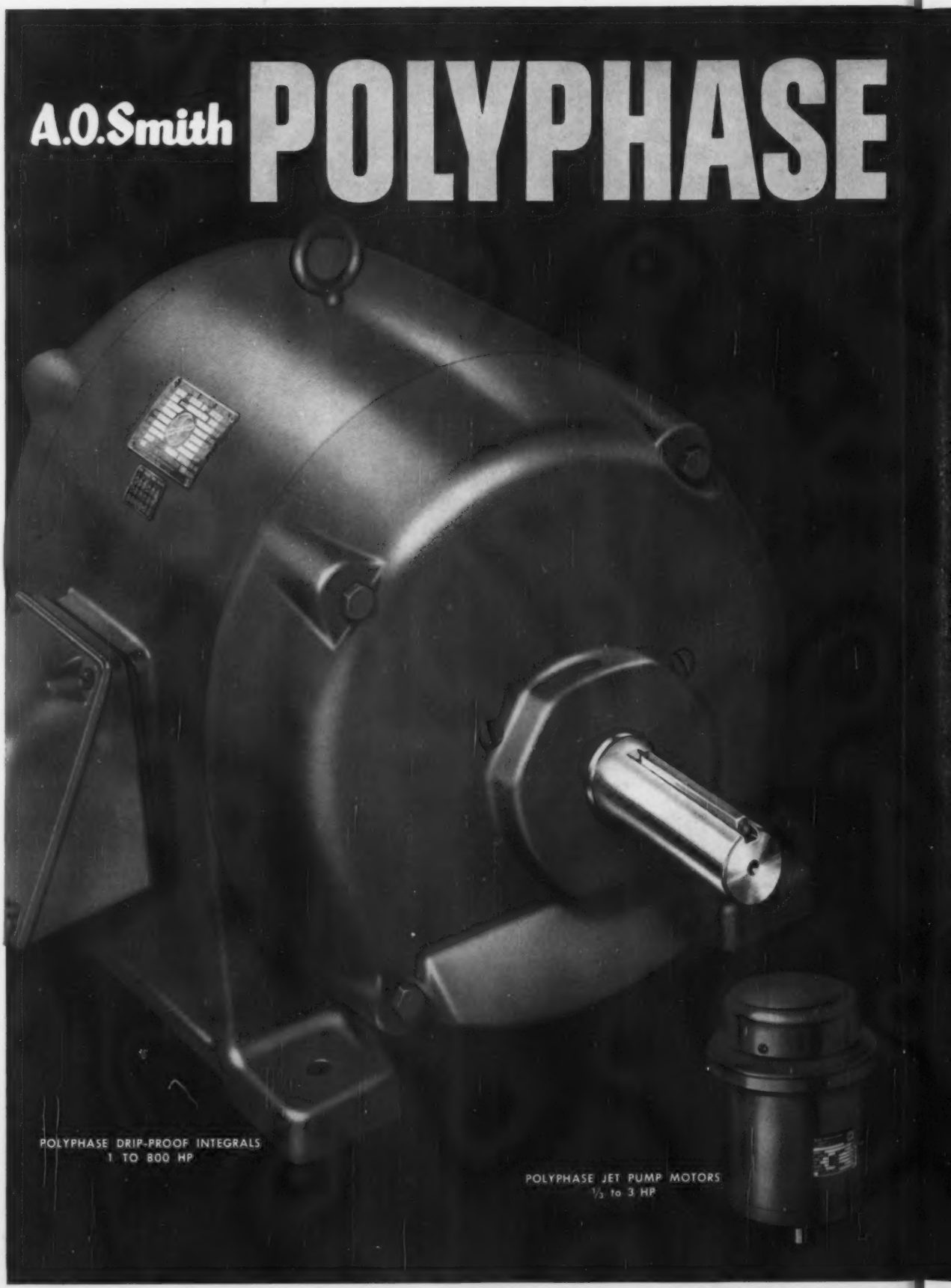
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send information on the following:

☐ Republic METAL LUMBER ☐ Wedge-Lock Shelving
☐ Truscon "Budget Buildings"
☐ Have a Materials Handling Engineer call

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____


A.O.Smith
POLYPHASE
POLYPHASE DRIP-PROOF INTEGRALS
1 TO 800 HP
POLYPHASE JET PUMP MOTORS
½ to 3 HP

E MOTORS

POLYPHASE FRACTIONALS ⅓ to 1 HP
rigid or resilient bases
VERTICAL HOLLOW SHAFT POLYPHASE
INTEGRALS 1 to 700 HP
VERTICAL SOLID SHAFT POLYPHASE
INTEGRALS 1 to 800 HP
TEFC and EXPLOSION-PROOF POLYPHASE
INTEGRALS 1 to 500 HP
CLOSE-COUPLED POLYPHASE PUMP
MOTORS 1 to 150 HP

1/3 to 800 hp

YOURS from the case of the A. O. Smith motor man

Here's what amounts to "supermarket" variety — eight basic types of polyphase motors, each available in a wide range of sizes and with practically any electrical or mechanical modification needed.

But in addition to wide choice that helps you get the motor best suited for your application, you get scores of quality features that pay off in uninterrupted service, longer operating life, lower maintenance cost. Every motor is designed to offer ample protection against temporary overloads or voltage drops. You get balanced insulation to afford maximum protection against phase-to-phase or phase-to-ground breakdowns during high amp surges.

All the engineering assistance you want or need is available for designing a motor into your product or applying standard models. What's more, many models are available from stock, in both old and current NEMA frame sizes.

Why not contact your A. O. Smith motor man now? Write for Bulletin EM-159 or refer to Sweet's Catalog to get the complete story on fractionals as well as A. O. Smith's complete line of integrals and hermetics—⅓ to 800 hp.

Through research ...a better way

A.O.Smith
CORPORATION

ELECTRIC MOTORS
Tipp City, Ohio
A. O. Smith International S. A., Milwaukee 1, Wisconsin, U.S.A.

CIMCOOL ANNOUNCES...

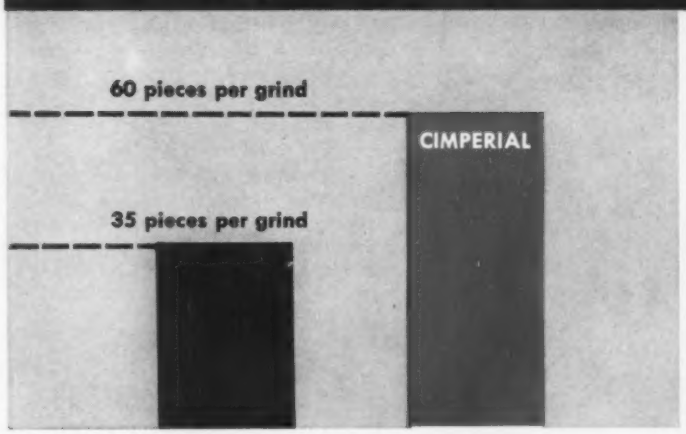
CIMPERIAL

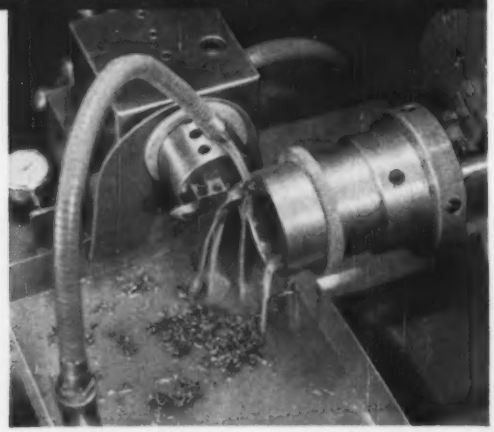
A Crowning Achievement in Cutting Fluids!

Now—Cincinnati Milling Products Division presents the most advanced cutting fluid in the history of the industry—CIMPERIAL, crowning achievement of the great line of CIMCOOL° products!

Since shortly after World War II, the Cincinnati Milling Products Division has conducted continuous and exhaustive research into Cutting Fluid action. This intensive study led to the introduction of radically different CIMCOOL, and then nationally acclaimed CIMCOOL S2. And now—CIMPERIAL!

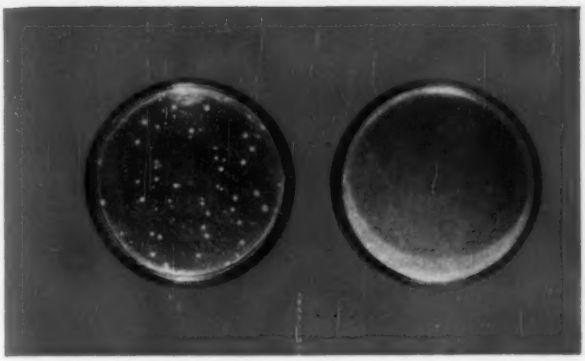
CIMPERIAL IS THE NEW SOLUTION FOR METAL CUTTING PROBLEMS!



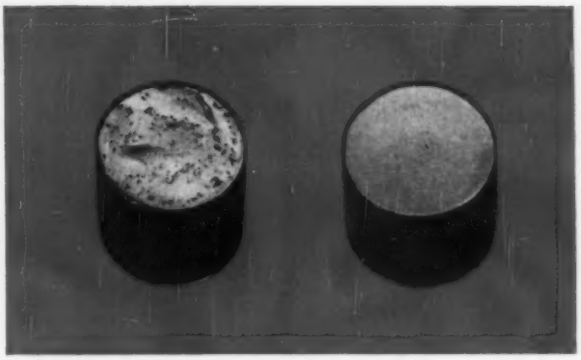


CIMPERIAL, a chemical solution, *defeats heat* and *increases tool life*. CIMPERIAL's new extreme pressure (EP) additives, which it contains in abundance, withstand high temperatures and pressures. By lowering friction, one source of heat is reduced. CIMPERIAL also decreases the larger source of heat, metal deformation. Through the elimination of both sources of heat to a remarkable degree, CIMPERIAL greatly increases effective tool life, and permits *faster speeds and feeds*. For example, in the plant of a diesel engine maker, CIMPERIAL boosted the average pieces per tool grind from 35 to 60 (a 70% increase) on a special lathe turning cast iron pistons complete.

CIMPERIAL, in a series of exhaustive tests, obtained more efficient metal cutting action with less force on the tool than either a soluble oil or a cutting oil. The threading operation pictured here shows the set-up of one of the many tests made. CIMPERIAL obtained a better finish, visible proof of the effectiveness of CIMPERIAL's newly discovered EP additives.

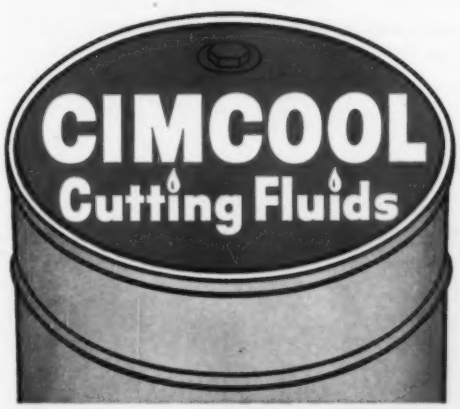


CIMPERIAL has a maximum amount of effective bactericides. It contains no food for bacteria . . . will *not* turn rancid! On the left in the illustration, note the white specks. These are bacterial colonies grown in three days from a measured quantity of ordinary tap water. On the right, the same tap water was used to dilute CIMPERIAL. After three days, no bacterial growth has occurred, due to the effective bactericides in CIMPERIAL.



CIMPERIAL offers positive rust control unequalled by any other water miscible cutting fluid. This rust control is obtained by incorporating two types of chemical rust inhibitors which work independently to counteract corrosion on all metals. Mixtures of CIMPERIAL and a soluble oil, each at 1:40, were left overnight on the polished steel cylinders shown above. CIMPERIAL shows no rust; the soluble oil sample shows light rust overall, with one area of intensive rusting.

YOU, TOO, can lower tool costs and increase your production with new, revolutionary CIMPERIAL! In CIMPERIAL, the Cincinnati Milling Products Division has developed the most advanced and completely effective cutting fluid in the metal-working industry. It is an entirely *new* chemical concentrate *especially designed for heavy-duty applications.* CIMPERIAL is the only water-soluble fluid capable of performing the tough, low-clearance, low speed operations previously limited to cutting oils. CIMPERIAL also provides excellent cutting action on standard operations. CIMPERIAL is a *chemical solution*—not an emulsion—which effectively covers *95% of all metal cutting jobs.*



FOR 100% OF ALL METAL CUTTING JOBS

Production-proved products of The Cincinnati Milling Machine Co.

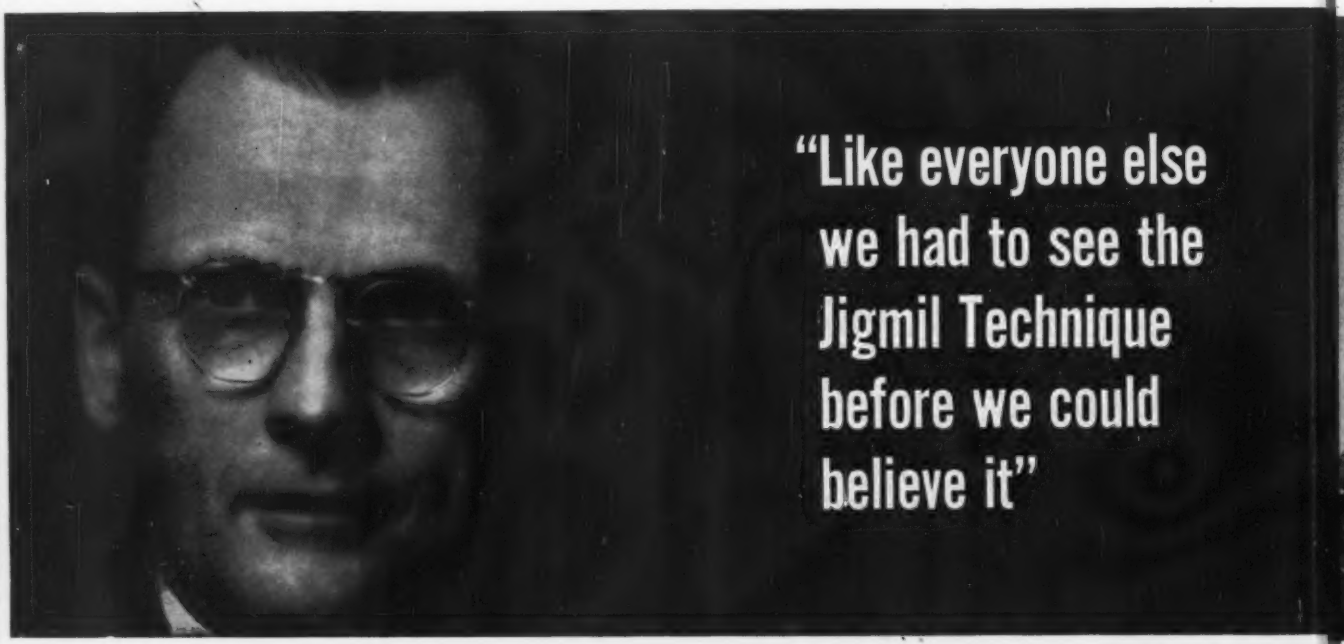
CIMPERIAL—*newest* in the world-famed, industry-proven line of **CIMCOOL Cutting Fluids! CIMCOOL 52 Concentrate**—Covers 85% of all metal cutting jobs. **CIMPLUS**—The transparent grinding fluid with exceptional rust control. **CIMCUT Concentrates (AA, NC, 55)**—For jobs requiring oil-base cutting fluids. **CIMCOOL Tapping Compound —CIMCOOL Bactericide—CIMCOOL Machine Cleaner.**

For full information on great new CIMPERIAL and the complete family of CIMCOOL Cutting Fluids, call your CIMCOOL Distributor today. Or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

® Trade Mark Reg. U. S. Pat. Off.

RICHARD F. MOORE, President
Moore Special Tool Co., Inc.

a man who came to Fair Street



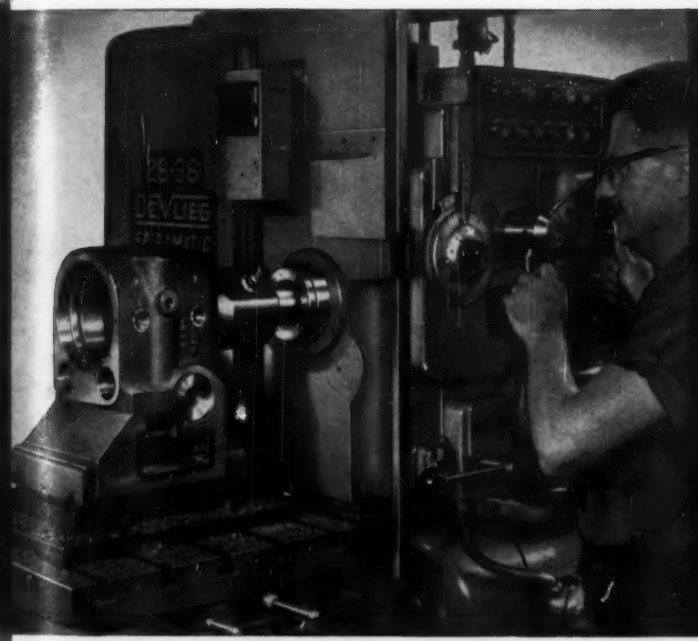
"Our visit to Fair Street resulted in the purchase of three JIGMILS. The machines are part of a complete retooling program to help us meet rising costs and hold the line on our prices. We use the JIGMILS to machine larger jig borer and jig grinder parts to the fine accuracies required in our own machine tool products. We do not believe that we could design and build a special machine for our own needs that would beat the JIGMIL. For us, the JIGMIL is the last word."

RICHARD F. MOORE

DE VLIEG MACHINE COMPANY, FAIR STREET • ROYAL OAK, MICHIGAN

SOME OF OUR JIGMIL USERS

American Steel Foundries
Avey Drilling Machine Co.
Axelson Manufacturing Co.
Baldwin-Lima-Hamilton Corp.
Barber-Colman Company
Blanchard Machine Co.
E. W. Bliss Co.
Boyar-Schultz Corp.
Brown & Sharpe Mfg. Co.
Bryant Chucking Grinder Co.
Buhr Machine Tool Co.
Cincinnati Milling Machine Co.
Cincinnati Shaper Co.
Cleveland Automatic Machine Co.
Cone Automatic Machine Co., Inc.
Crankshaft Machine Co.
Cross Company
Davis & Thompson Co.
Detroit Broach Company
Ex-Cell-O Corporation
Foote-Burt Company
Gisholt Machine Co.
George Gorton Machine Co.
Gould & Eberhardt, Inc.
Greenlee Bros. & Co.
Heald Machine Company



ADVANTAGES OF THE JIGMIL TECHNIQUE reported by Moore Special Tool Co., Inc.

- Fast, fool-proof positioning
- Quick tool changes
- Fast indexing of part to four sides
- Retraction of table for measuring
- Depth of hole stops
- Quick change of wide spindle speed range
- Large range of boring bars from DeVlieg stock
- Easy accessibility to controls

ACCURACY IS AN ECONOMY!

JIGMIL—THE MACHINE TOOL BUILDERS' MACHINE TOOL

Moore uses its three JIGMILS with DeVlieg Microbore boring bars to mill, bore, drill and tap large components for its own line of ultra precision machine tools. A jig grinder spindle housing is shown being machined on their 2B-36 JIGMIL equipped with a DeVlieg 20" x 20" index table. Parts are rough and finish machined to precise limits of accuracy on four sides in one setting by simply indexing the index table.

Ingersoll Milling Machine Co.
Jones & Lamson Machine Co.
Kearney & Trecker Corp.
Landis Tool Co.
R. K. LeBlond Machine Tool Co.
Lees-Bradner Company
Lodge & Shipley Company
Mechanical Specialties Co.
Moore Special Tool Co., Inc.
National Automatic Tool Co., Inc.
National Machinery Co.
Onsrud Machine Works
Rockford Machine Tool Co.
Snyder Tool and Engineering Co.
Sundstrand Machine Tool Co.
Warner & Swasey Company

WILL YOU BE THE NEXT TO VISIT FAIR STREET

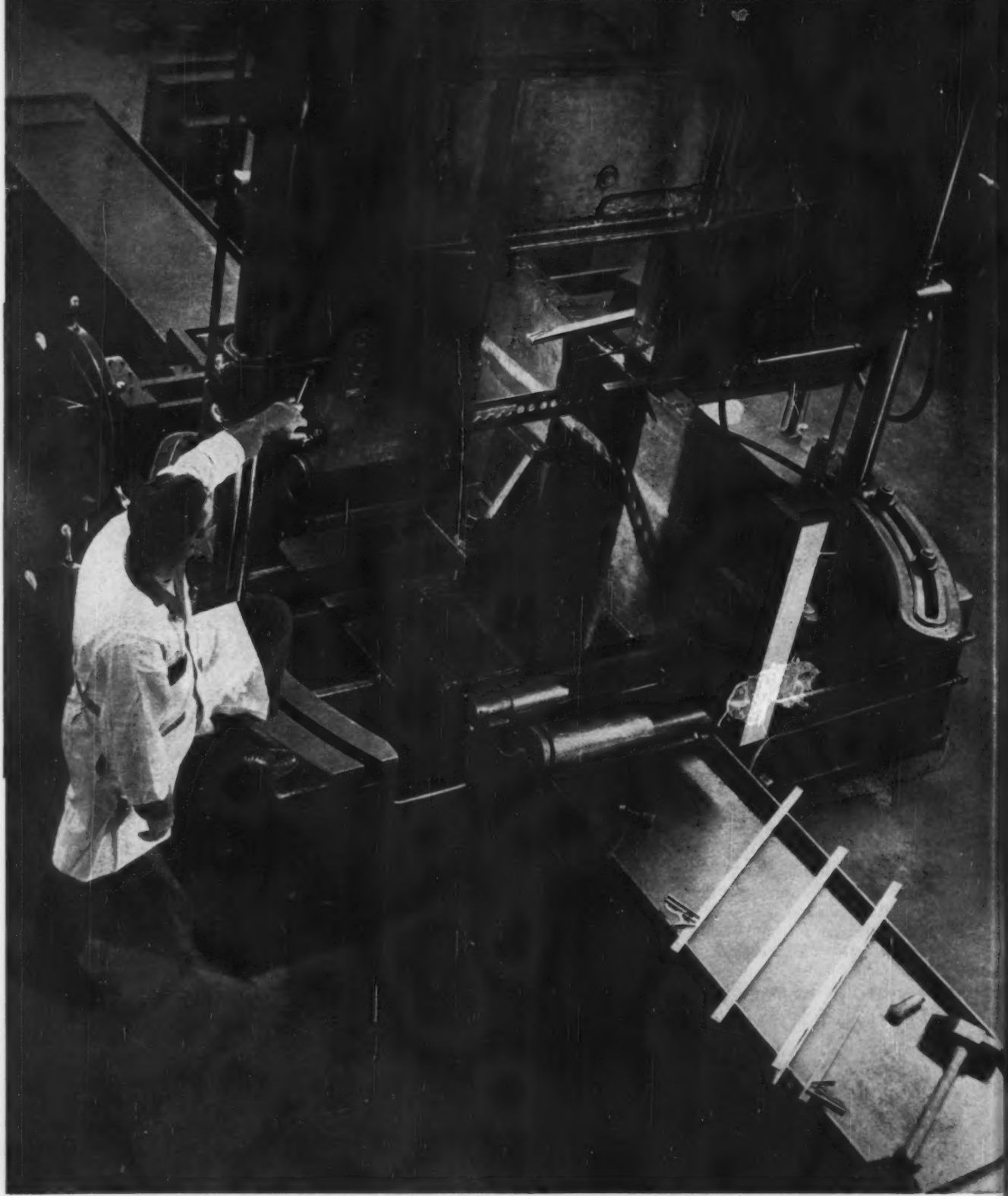
Our newest catalog will help you decide. May we send it?

DeVlieg

SPIRAMATIC JIGMILS®

ACCURATE HOLES AND FLAT SURFACES IN PRECISE LOCATIONS

integrated CRUCIBLE steel service



The customer needed plastic mold steel cut to his specs as fast as he could get it. The Crucible warehouse confirmed his order, gave him immediate delivery because it had both the steel and the saw (big 24" x 42" hacksaws which can slice a 40" block in 4-4½ hours).

maintains broad range of local customer services

– ranges from in-stock deliveries to metallurgical research

Here's *service in depth*, made possible by Crucible's integrated operation. It starts with in-stock deliveries of the steels you need and goes on to provide complete technical assistance for engineers, production, toolroom and maintenance men. And the entire service is available from all of Crucible's 27 warehouses –

(1) *Deliveries from local stocks* of 16,000 specialty steel items, including all grades, shapes and sizes.

(2) *Basic specialty steel data* – complete breakdowns on properties, characteristics, as well as machining and fabrication details. (Warehouse account salesmen can frequently recommend the best steel for the end use.)

(3) *Metalworking assistance* with unusual machining and fabricating problems – by trained, experienced sales-service engineers who specialize in tool steels, stainless, alloys.

(4) *Metallurgical research* – help in developing steels for tomorrow's more exacting applications from Crucible's metallurgists, who will come to your plant on call.

Here's what one purchasing agent recently had to say about this over-all service: "We need lots of help with new steels – ones we haven't used before. The reason we rely on Crucible warehouses is because their men know the answers – or can get them for us quickly."

Why not simplify your own specialty steel purchasing problems by taking advantage of this integrated service? *Crucible Steel Company of America, Dept. PA06, Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

Crucible metallurgists will come to your plant, if necessary, to help engineers use new steels or metals like titanium.

Sales service engineers' experience with fabricating, machining problems can solve toolroom and production problems.

Truck drivers speed orders for overnight delivery to you — or earlier if your order is an "emergency."

TOOL STEELS – Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS – Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS – Crucible Max-el® rounds, hexagons, plates and brake die steel

ALLOY STEELS – Bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS – Hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS

HOLLOW TOOL STEEL

Teletype operators get direct reports on quantities available everywhere in the warehouse system — from Crucible's inventory-control computer room.

WELDING AND HARD FACING ROD

PLASTIC MOLD STEELS

PERMANENT MAGNETS

– and many others

CRUCIBLE STEEL COMPANY OF AMERICA

Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton Denver • Detroit • Grand Rapids • Harrison • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • New Haven • New York Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis St. Paul • Syracuse • Tampa • Toledo • Tulsa • Toronto, Ont.

ANOTHER IN A SERIES
OF MOTOR FACTS
FROM ALL INDUSTRIES

"Roughest duty we have ever seen motors endure"

reports Marquette Iron Mining Co. of the Westinghouse Life-Line A motors in its Eagle Mills Pelletizing Plant

Operating continuously, 24 hours per day, dependable Westinghouse Life-Line® "A" motors drive a network of fans and conveyors at the Eagle Mills Pelletizing Plant of Marquette Iron Mining Co., Ishpeming, Michigan.

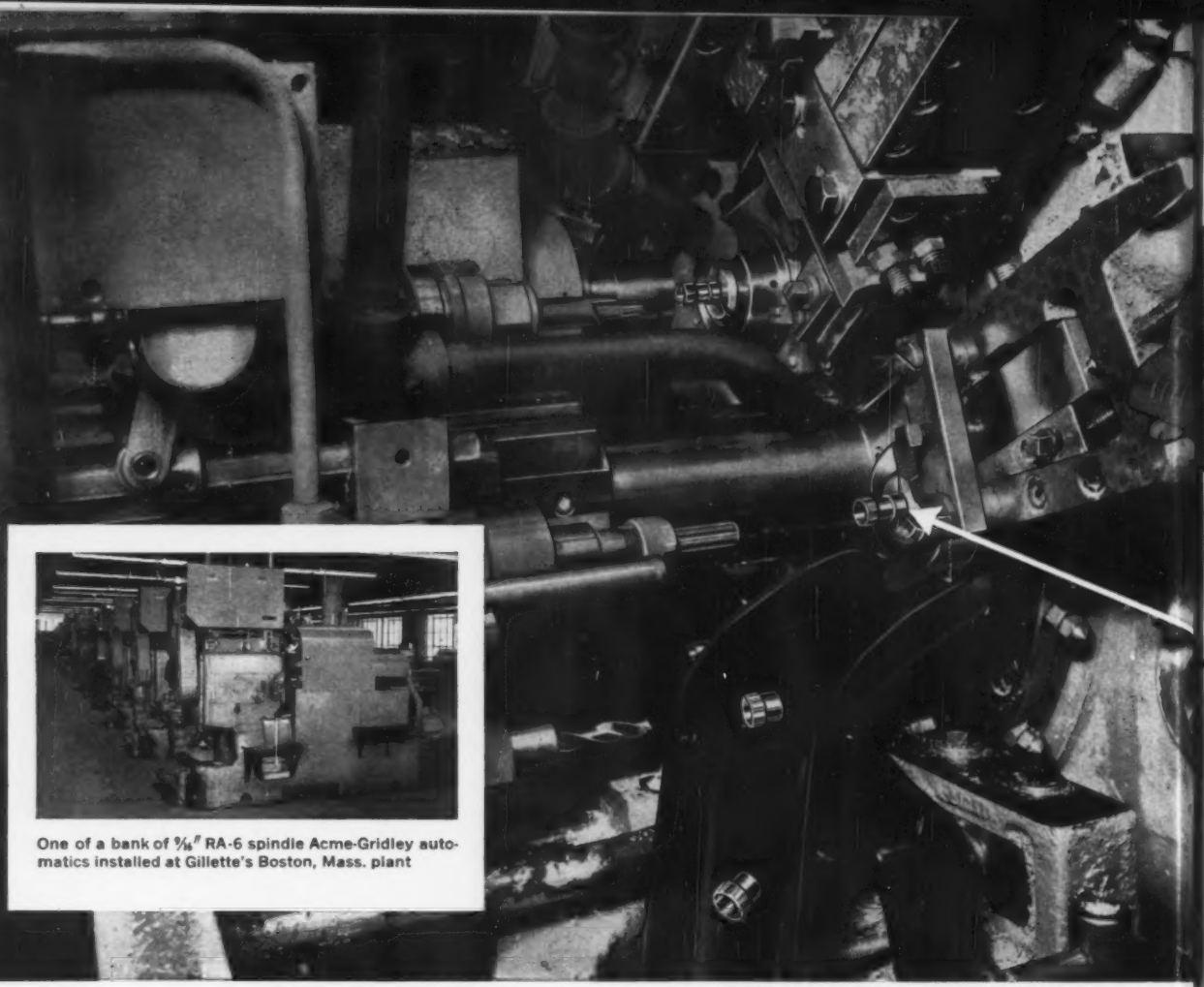
Some of these motors are located directly above a sintering machine where ambient temperatures often exceed 200° F and the motor is subjected to deposits of finely divided iron ore. Under these conditions, not a single motor breakdown or failure has occurred during 11 months of service.

Says Mr. Ed Gagnon, plant electrician, "Our Westinghouse motors have given us complete reliability on the roughest tests we have ever seen a motor endure."

For specific information about the ways your operation can benefit from the improved performance, longer life and reduced maintenance offered by the dependable Life-Line "A," contact your nearby Westinghouse sales engineer. Or write to Westinghouse Electric Corporation, P.O. Box 868, 3 Gateway Center, Pittsburgh 30, Pennsylvania. J-22077

YOU CAN BE SURE...IF IT'S
Westinghouse

Deposits of powdered iron ore are no problem to this 2-hp Life-Line "A" motor driving conveyor which carries powdered iron ore to the balling disc where ½" pellets are formed. Presealed, prelubricated Life-Line "A" bearings keep dirt and other material out.



One of a bank of 7/16" RA-6 spindle Acme-Gridley automatics installed at Gillette's Boston, Mass. plant

Close up of tooling zone showing adjusting knob in 5th position

Precisely Formed, Marked, Knurled,

Broached, Micro-finished, Reamed and Tapped . . .

ON ONE ACME-GRIDLEY AUTOMATIC

in *4½ Seconds!*

The adjusting knob on this new adjustable razor is but one of its several precision components made by The Gillette Safety Razor Company on 5/16" Acme-Gridley six spindle bar automatics. The requirements were extremely exacting, *with as many operations as possible performed in the primary setup!*

For example: nine positions are stenciled on a turned portion of the O. D. with interrupted knurling held in exact peripheral location to the marking. In addition, close tolerance hole sizes are involved and *all* external burrs completely removed. All tools had to be synchronized to produce the exacting number-knurl relationship on the periphery.

Working in close cooperation with Gillette engineers, National Acme specialists took full advantage of the wide-open tooling zone, independently operated tool slides and the extreme accuracy and flexibility of direct camming . . . to perform an ingenious job of tooling. Many operations normally considered "secondary" were accomplished in the primary setup. Costly rehandling and "second machine investments" were reduced.

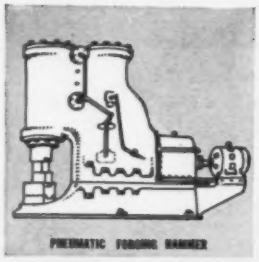
Write or ask one of our representatives for the complete story on the industry's most modern approach to *your* cost reduction problem.

Pioneer in Circumferential Automation

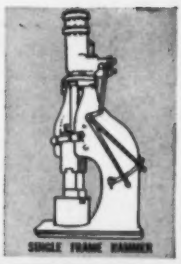
National Acme

The National Acme Company
175 E. 131st Street
Cleveland 8, Ohio

Sales Offices: Newark 2, N.J.; Chicago 6, Ill.; Detroit 27, Mich.

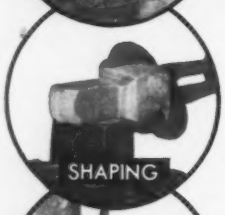


A Chambersburg Flat Die Hammer will save time and money ..

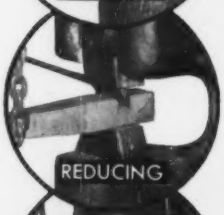


A 200 lb. Chambersburg Motor Driven Pneumatic Hammer—Self-contained

A 400 lb. Chambersburg Single Frame, General Utility Hammer (Steam or Air)

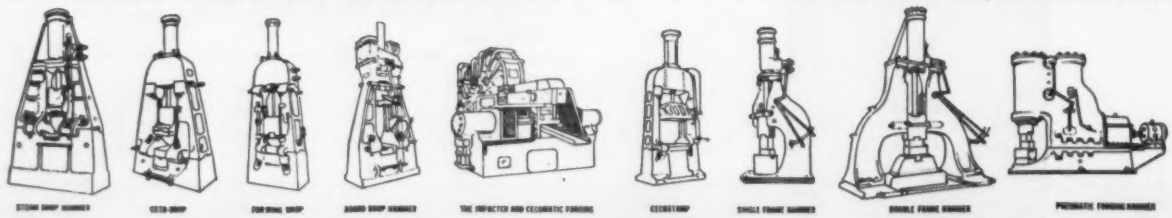


A small or moderate size flat die hammer is a great convenience for any shop where machinery repair or maintenance work is carried on. You can save time and money and often make a better repair part than you can buy, or make by casting or welding. When you need a replacement part in a hurry, or an emergency job of even unusual size, that's where a Chambersburg hammer will pay for itself. If you have steam or air available, a single frame steam hammer will be your logical choice. If not, a Chambersburg pneumatic, with motor, compressor and hammer in one, will be your best bet. Write for complete information.



CHAMBERSBURG • The Hammer Builders

CHAMBERSBURG ENGINEERING COMPANY . . . . . CHAMBERSBURG, PENNSYLVANIA



Strong Restraining Influences...

Roebling Hose Reinforcing Wire

Roebling Hose Wire, Hose Reinforcing Wire and Hose Wrapping Wire bear the stamp of Roebling's strict attention to constant uniformity. As with all Roebling wire products, each is wholly Roebling-made and Roebling-controlled, from open hearth to packaging. Tensile strength and forming qualities, finish and gage are of an excellence that proves itself in use.

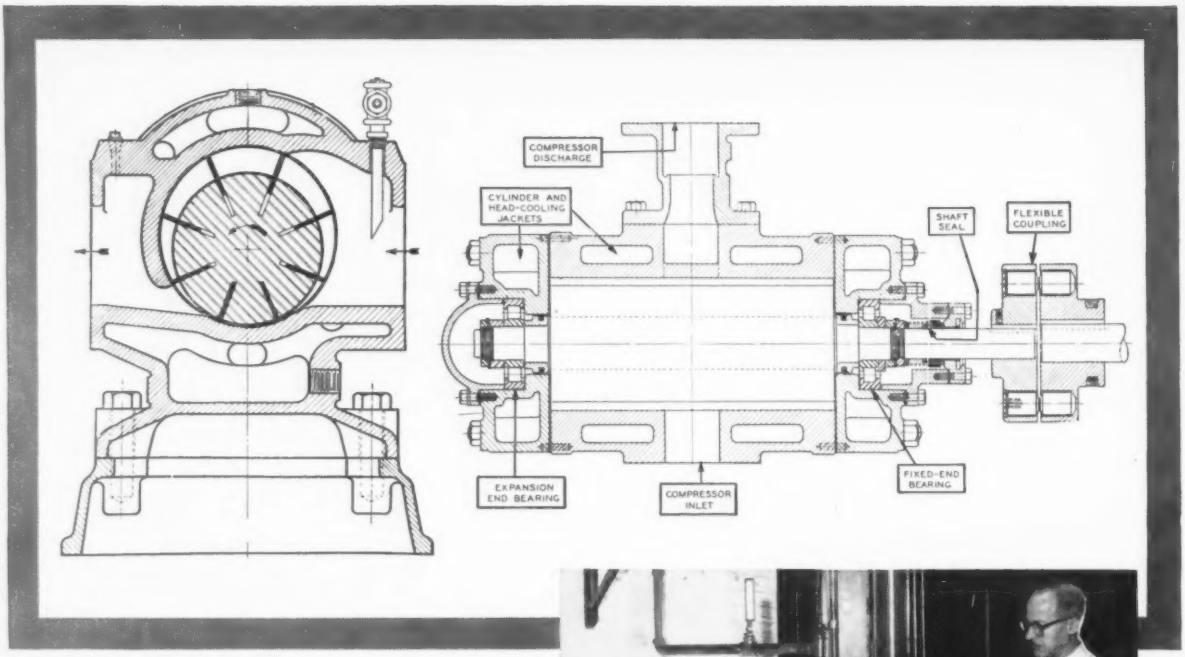
Resistance to internal and external pressures and wear are what you look for in hose wires and what you pay for. With Roebling, you *get* them.

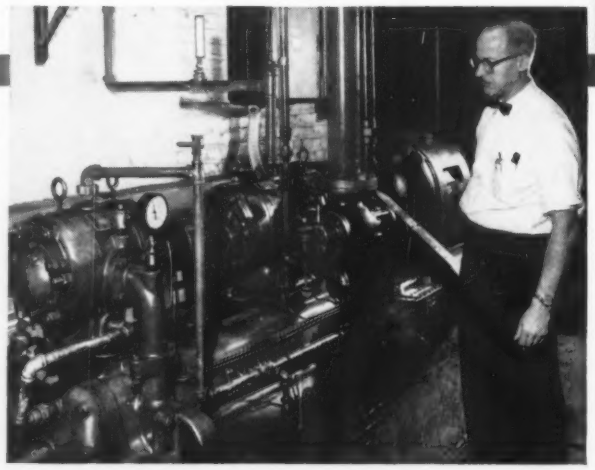
For further information on these and other Roebling quality products, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

Roebling...Your Product is Better for it

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation





Hard service never affected this Fuller rotary's original output—230 cfm. of air at 90 lb. G., reports Mr. Schott, chief engineer, Thomas C. Wilson, Inc., Long Island City, N.Y.

FULLER ROTARY COMPRESSOR RUNS 13 YEARS WITHOUT DOWNTIME

A Fuller rotary at Thomas C. Wilson, Inc. got its first maintenance shutdown recently, for renewal of roller bearings and rotor vanes—after running without downtime since 1945.

4 years of 24-hour service. The Wilson plant makes tube cleaning equipment, tube expanders and portable pneumatic tools, and so makes heavy daily demands on shop air. For the first four years, three-shift operation kept the Fuller rotary running round the clock. Since 1949, it's been working eight-hour shifts.

Simple design means trouble-free service. Besides bearings, the only moving parts in a Fuller vane-type rotary compressor are the cylinderical rotor and the blades. These compensate for wear automatically. Cylinder head slips off, permitting blade and bearing inspection in a matter of minutes.

Compact and vibration-free. Direct-drive system saves space. Simple, rugged design gives constant service without extensive supervision. Thus, Fuller rotaries can be installed out-of-the-way—on upper floor, on balconies, in basement corners, using low-cost, light-weight foundations.

1189
C-340

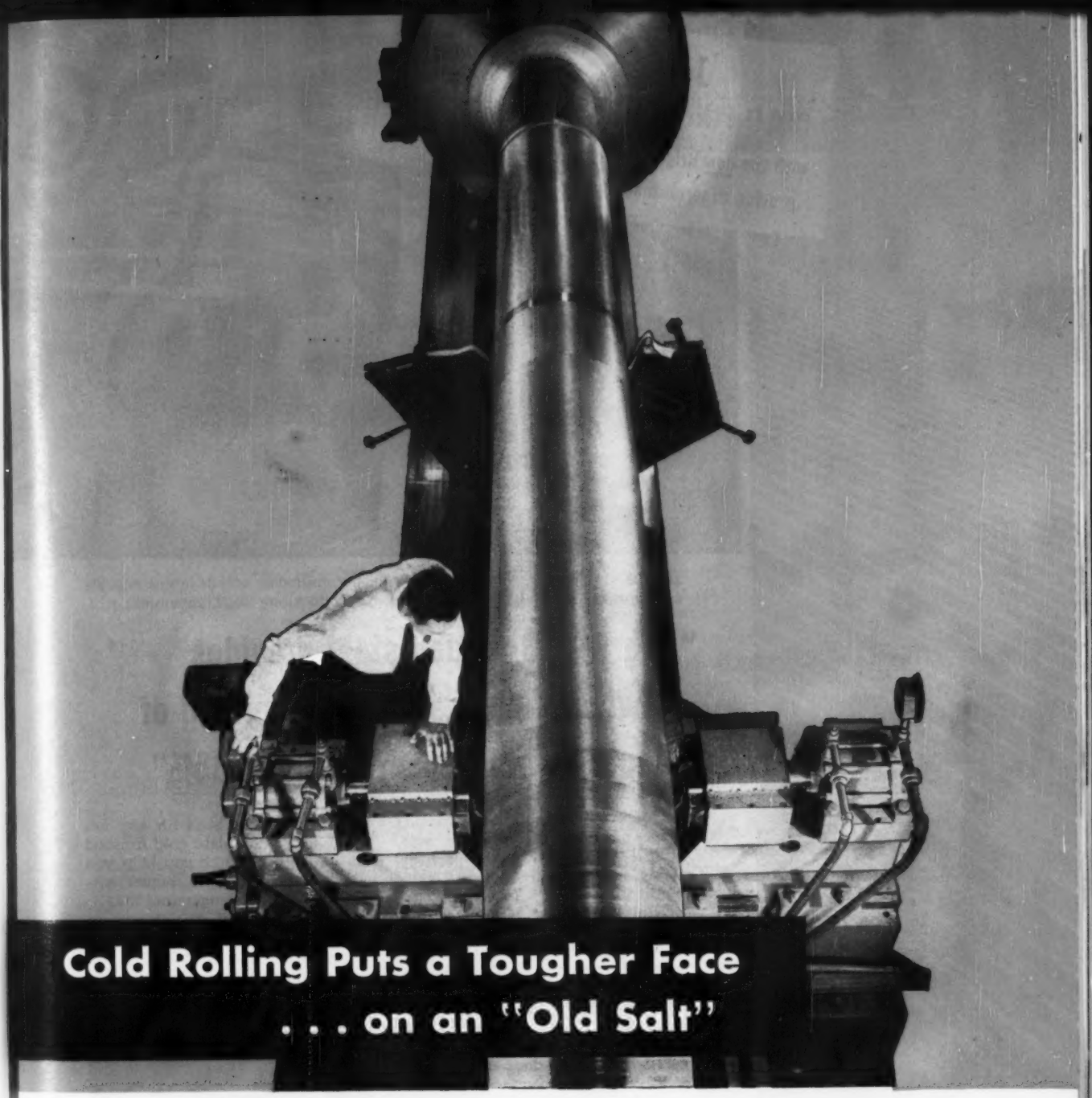
Write today for detailed information on the full line of Fuller rotary compressors for in-plant services, gas gathering, and industrial refrigeration.

FULLER COMPANY
GENERAL AMERICAN
TRADE MARK

FULLER COMPANY
122 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Birmingham • Chicago • Kansas City • Los Angeles • New York • San Francisco • Seattle

Fuller
....pioneers in harnessing AIR

PIONEERS OF HIGH-EFFICIENCY VANE TYPE ROTARY COMPRESSORS SINCE 1930



Cold Rolling Puts a Tougher Face . . . on an "Old Salt"

To increase fatigue resistance, endurance limit and to fight the corrosive action of the sea, Erie Forge & Steel technicians cold roll ship's tail shafts as illustrated above. The life of the forged steel tail shaft is prolonged by cold rolling under the propeller and the after bearing. The surface toughness thus effected reduces fretting corrosion, minimizes pitting, costly failures and the hazard of propeller loss at sea.

Cold rolling is applied not only to new shafting but also for reconditioning existing ship's shafts, thus saving sizeable replacement costs in many instances.

Designed and built by Erie Forge & Steel engineers, the machine cold rolls shafts of any length and up to 30 inches in diameter. Any desired pressure up to 37,000 pounds can be exerted by the hardened steel rollers on each side of the shaft.

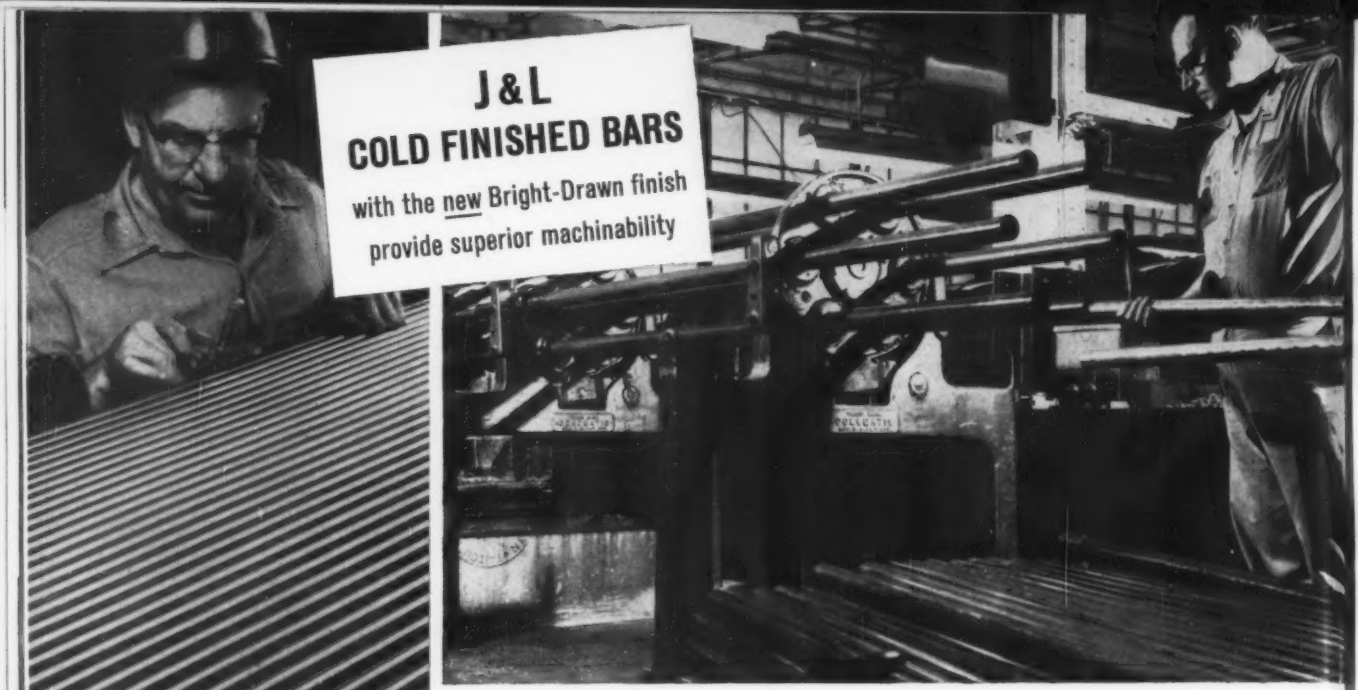
The Society of Naval Architects and Marine Engineers recommends that all ship's propeller shafts be cold rolled as a safety measure. This cold rolling process is approved by The Bureau of Ships, United States Navy.

Another of the special services characteristic of the continuing progress in steel improvement at Erie Forge & Steel. Let us work with you on your steel forging and casting requirements.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE



J&L COLD FINISHED BARS

with the new Bright-Drawn finish provide superior machinability

J&L's B-1113 leaded steel permits 35% higher machining speeds in this multiple spindle screw machine operation at Singer Manufacturing Co., Elizabethport, N. J.

"J&L B-1113 leaded steel provides flawless finish, speeds machining of Singer sewing machine parts 35%"

"Flawless finish of 'Slant-O-Matic' hook assembly components machined from J&L B-1113 leaded steels and carefully polished prevents thread snags," according to officials of Singer Manufacturing Company.

With the "Slant-O-Matic" hook assembly moving at 3200 revolutions a minute, the slightest burr or tool mark on any part would snag the thread. Singer officials report the machined surfaces with J&L steel are "definitely easier to polish." They are now using leaded steel in over 100 components on the scores of industrial and household machines they manufacture.

"Use of cold finished leaded steel bars also speeds production 35% on our multiple spindle screw machines. And we get 25% longer tool life," Singer officials report.

Similar machining qualities and speed are possible in your operations with J&L controlled quality cold finished steel bars. A J&L steel specialist can recommend exactly the right steel for any job from J&L's complete cold finished line. Chances are he can help you get improved finishes, higher cutting speeds and longer tool life.

Call your local distributor or write to Jones & Laughlin Steel Corporation, Dept. 403B, 3 Gateway Center, Pittsburgh 30, Pa.

The superior surface finish on hook assembly components prevents thread snags. Parts are machined from J&L leaded steel bars with the improved new Bright-Drawn finish.

J&L STEEL

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

GOOD BUSINESS NEWS from the Dept. of Commerce: New orders continue to exceed the rate of sales in manufacturing. The result is a small lengthening of manufacturers' backlogs. New orders in November, latest figures available, were at $27.9 billion, seasonally adjusted; new sales at $27.6 billion.

NEW AUTOMOTIVE USE FOR GALVANIZED SHEETS may be in the making. Zinc industry sources say it hinges on development work on new types of body construction which would use large tonnages of galvanized sheet, primarily on the underside of the auto. If this market develops it could strain galvanized capacity.

DEFENSE SPENDING WILL CLIMB, despite Ike's efforts to economize. Capital insiders say defense outlays will climb by about $1 billion in the new fiscal year. This means an over-all military budget of around $42 billion starting on July 1.

MILLS ARE GOING ALL-OUT on the use of oxygen to step up steel output. You can look for a steady increase in tonnage oxygen use in openhearths. U. S. steel indicates it is converting 25 pct of its steelmaking capacity to oxygen practice. Oxygen figured in near-7-million-ton steel capacity rise in '58.

TURBINE ENGINE FOR AUTOS may be only a few years off. At least that's the word from Chrysler Corp. It reports that materials and design bottlenecks are being overcome rapidly.

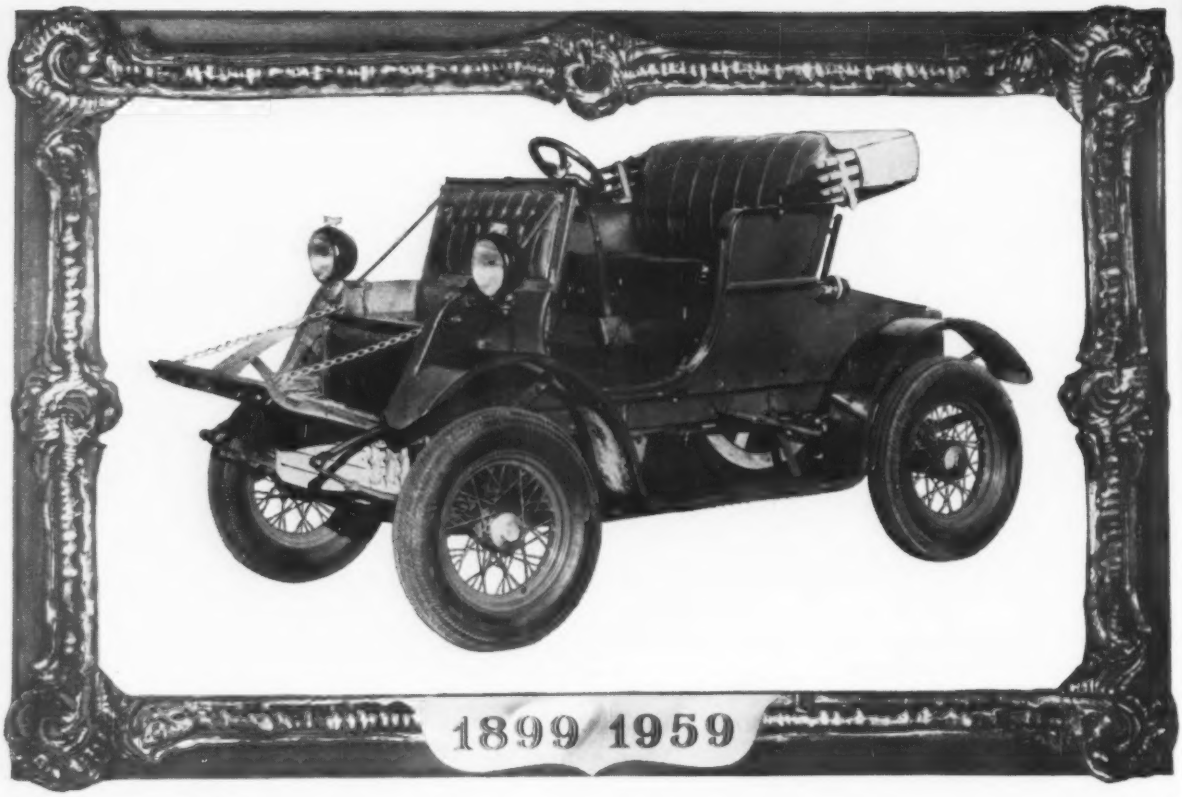
INDUSTRIAL TRUCKS ARE WORKING into new jobs in aluminum and copper plants. In an aluminum reduction plant they are being used to feed ore into reduction cells and to remove hot metal for pouring into pigs. In a copper plant, a king-size ladle truck carries and pours 15 tons of molten copper.

TAPE CONTROL OF MACHINE TOOLS has moved another step forward. Giddings & Lewis has just announced a tape-controlled vertical turret lathe. The company says it's a real cost-cutter for the whole range of short-run jobs vertical turret lathes are built to handle.

ELECTRIC AUTO IS COMING BACK. A West Coast company expects to begin producing a new low-slung sports-type electric auto next March. It will be powered by a battery which will be re-chargeable from a household electric outlet. It is expected to run about 80 miles between charges.

WEST COAST BUSINESS is looking up. A Prudential survey of more than 1000 business leaders indicates: First quarter business will be better than both the first and last quarters of 1958. Almost all major industries will share in the improvement.

ZINC FINISHED 1958 STRONG. December zinc shipments continued to top output, further reducing smelter stocks. Shipments were off seasonally, but not enough to reverse the trend.



Everything's changed but the trademark on the bearings

BUILT by the St. Louis Motor Car Co. in 1899, this car was the first equipped with Timken® tapered roller bearings. It's still running. And today every make of American car but one uses Timken bearings. The things that the trademark "Timken" stands for haven't changed. It still means the highest quality, the best-known name in bearings, and the kind of service you can't get anywhere else. It means better performance with longer life and less maintenance in machine tools, steel mills, heavy construction machinery, farm implements and tractors —wherever wheels and shafts turn.

"Timken" is a registered trademark that identifies all products of The Timken Roller Bearing Company—tapered roller bearings, fine alloy steel bars, seamless steel tubing and removable rock bits.

It's to your advantage to remember that "Timken" is not a type of product. It's your assurance of the best in tapered roller bearings, fine alloy steels and removable rock bits. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable: "TIMROSCO".

TAPERED ROLLER BEARINGS • REMOVABLE ROCK BITS • FINE ALLOY STEEL

TIMKEN®

first in quality for 60 years

Drive for Defense Spending Hike May Doom Ike's Budget Hopes

Look for a Democratic push to increase defense spending over President's recommendations.

Russia's sun-orbiting rocket will be used as a club in budget battle.—By N. R. Regeimbal.

▪ President Eisenhower's bid to hold down inflation with a balanced $77 billion budget in the new fiscal year is almost certain to be crushed under a new surge of defense spending.

Top Democratic congressional leaders are already lining up their big guns to shoot holes in the spending program the President is presenting on Jan. 19.

Budget Battles Loom—Although defense spending will be the prime target for the lawmakers, several other programs similarly are in line for the "careful" study approach which usually means a boost in White House proposals.

Final outcome of the budget battles this year is likely to be a boost of $1 billion or more in defense spending over what the President proposes for the fiscal year beginning next July 1, and an increase of as much as $2 billion in his total government spending program.

Something For Everybody — Of the increase in defense spending, the Defense Department, as distinct from the services, and the Advanced Research Projects Agency, will get a big chunk. The Air Force is due for a big slice, and the Army and Navy reportedly will split the rest.

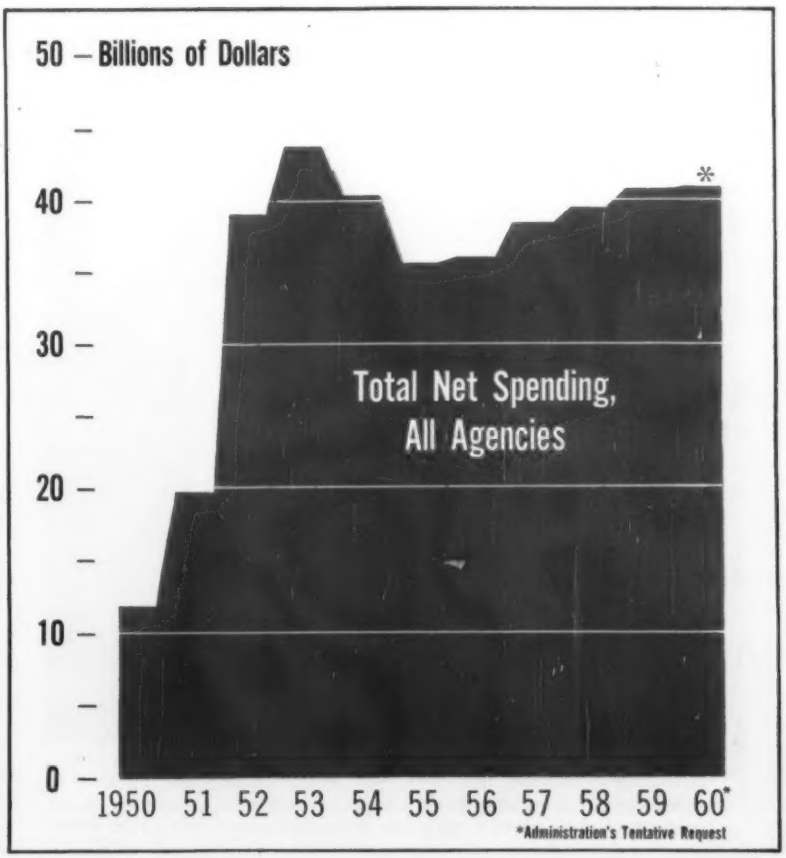
The President is proposing only a minor increase in defense spending —a hike of $100 million over the current year's $40.8 billion. However, although exact details won't be known for a few days, White House insiders make it clear that this slight increase does not tell the whole story.

Space-Age Trend — While the overall increase is small, the trend to bigger and bigger outlays for space-age weapons, research and related activities will be up sharply. More traditional spending programs are continuing to die lingering deaths.

In the current fiscal year, spending for missiles (including research and development, ground equipment, and sites) rose to $7 billion from $5 billion the previous year, while total defense spending jumped from $39.1 billion to $40.8 billion.

Democratic Strategy — But top Democrats on Capitol Hill sniff a

Will Defense Cost Level Off?



glowing political opportunity. The tone among lawmakers—heightened by the recent Russian sun-rocket success—is to criticize the Republican Administration's past efforts in space and science. They plan to "load up" the budget for more and bigger such programs, regardless of whether the funds can be usefully spent.

They'll get lots of help in these efforts from military spokesmen who have been quietly grumbling since the days of Charlie Wilson's Pentagon reign that defense is being sacrificed "on an altar of false economy."

Big Guns Readied—Democratic leaders on both sides of Capitol Hill are readying their first weapon in the coming fight. The Senate Space Committee, headed by powerful Sen. Lyndon Johnson, D., Tex. (he's also majority leader and chairman of the Defense Preparedness Investigating Committee) will open hearings late this month or early in February on the Administration's space-missile program.

About the same time, Rep. Overton Brooks, D., La., chairman of the new House Science and Astronautics Committee, will also hold hearings in about the same vein.

These hearings will be designed to embarrass the Administration. They'll be a prelude to serious attempts to boost the defense budget.

How Politicos Feel—Temper of the hearings has been set by these remarks of key lawmakers:

The U. S. is "not going far enough, fast enough" in the race with Russia for control of outer space and in developing super missiles (Sen. Johnson).

"We will have to move faster to catch up with the Russians." (Rep. Brooks).

"We'll give the military all the money that is necessary." (House Speaker Sam Rayburn, D., Tex.).

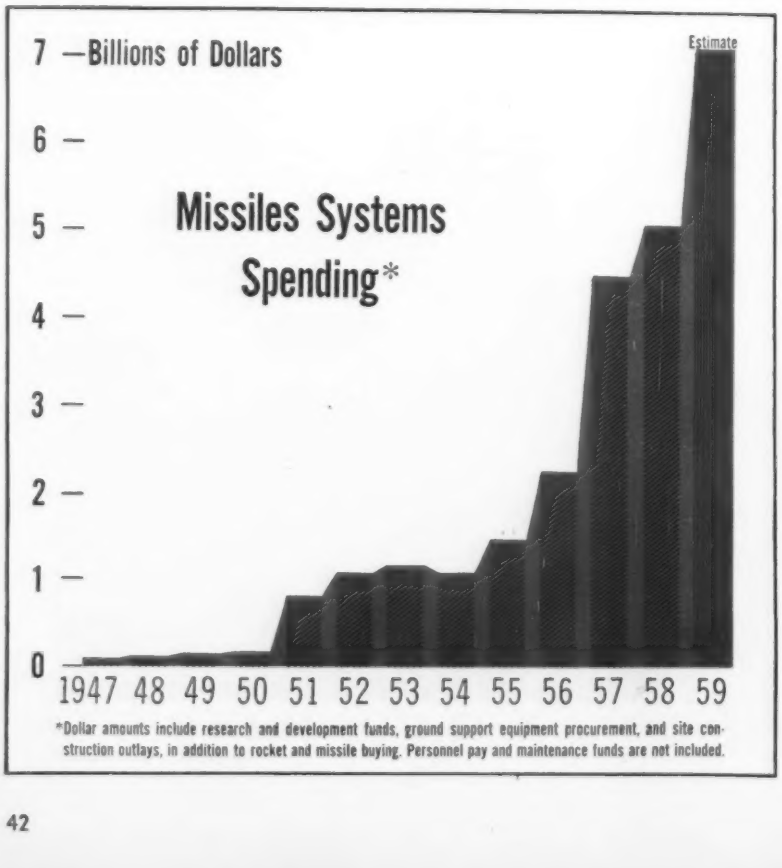
"The people want this country to overtake and surpass Russia in the exploration of space regardless of the cost." (House Majority Leader John McCormack, D., Mass.).

Poor Red Timing—If the Russians had wanted this country to boost its spending, particularly defense outlays, it couldn't have launched its "mechta" sun-orbiting rocket at a better time. It came on the eve of the opening of Congress and just as the government's budget debate was due to begin.

But efforts to boost the President's budget would have come anyway. When the word first leaked out that the President was aiming for a balanced budget almost $3 billion less than in the current year, congressional Democrats quickly took up their stands. Ike was criticized as proposing a "starvation" spending program because it would not provide enough jobs. Obvious cuts in some social and public works programs came under fire.

Reds Provided Springboard—The Soviet mechta rocket provided the

How Missile Programs Stretch the Budget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Estimate
Missiles Systems Spending*
1947 48 49 50 51 52 53 54 55 56 57 58 59
*Dollar amounts include research and development funds, ground support equipment procurement, and site construction outlays, in addition to rocket and missile buying. Personnel pay and maintenance funds are not included.

President Will Fight for His Budget

▪ President Eisenhower made one thing crystal clear in his annual state of the union message last week.

Ike knows the Democratic congress will make a strong move to "load up" his balanced $77 billion budget for the new fiscal year. He is counting on two basic weapons to hold the spending line.

Two Guns—Initially, he hopes his veto powers, which he will use freely, will take some of the steam out of the free spenders.

And, in an effort to win popular support for his bare-bones budget, Ike is holding out promise of a broad tax cut next year if lawmakers resist new spending programs.

The President wasted little time hitting right at the core of the problem. He warned the lawmakers that a sensible defense program requires "balance and perspective," and that needless duplication of weapons and forces must be avoided.

Threat—"We must guard against feverish building of vast armaments to meet glibly predicted moments of so-called maximum peril," he insisted. Useless spending in the name of security, Ike added, tends "to undermine the economy and therefore the nation's safety."

The President did map higher federal outlays for aid to science and education, health and welfare programs, development of water resources, urban renewal, and highways. But part of this he expects to make up with a cutback in the farm support program that is now costing the government about $5 billion per year.

Ike Wants—Other major points Ike wants from congress: A four-point labor bill aimed at protecting union welfare funds, secret union elections, improving collective bargaining, and blocking coercive practices; civil rights legislation; and a speed-up in missile and rocket research and development.

perfect springboard, not only for hikes in direct defense spending, but in other spending programs as well—some related and some not.

One basic premise of the President's budget—that traditional defense spending for such items as tanks, mortars, and even some piloted aircraft—must be sacrificed to pay for the new missile-age program will come under fire.

Foreign Aid Angle—Without reduction in some of these programs, the President's budget will automatically go into the red, even without addition of any new spending programs.

Mr. Eisenhower is proposing a half-billion-dollar hike in foreign aid appropriations. In past years, the lawmakers have cut these White House programs. Under the pressure of "damaged U. S. prestige" in the so-called uncommitted areas of the world, however, his $3.9 billion request could go through, and possibly even be increased.

Mechta May Spur Inflation—While the Red sun-rocket has deep scientific, technical, political, and military implications, it will also have a serious economic impact on this country.

The scramble it's producing isn't as sharp as in the immediate post-sputnik days, but the pressure of higher defense spending and another unbalanced federal budget will mean another round of inflation. Mechta will tend to pull prices and wages in this country upward in its wake.

Military Buying Shift—In addition, military procurement will shift even further. The government won't be as big a customer for large tonnages of traditional heavy metals and goods.

Instead, it'll be buying specialty metals and raw materials formed into intricate, precision, and expensive end products.

Moon, Mars, Venus—The President's $40.9 billion defense budget contemplates a somewhat quickened timetable for exploration of outer space, leading eventually to a manned moon rocket. It calls for one, and perhaps three U. S. moon shoots, which may follow the Russian rocket into the far reaches of visible space. It reportedly also calls for a shot at Mars this summer, and perhaps Venus later.

Additional satellite experiments are in the works, including preliminary work for an eventual reconnaissance satellite.

A Losing Battle—Much of this timetable will be detailed to Congress in secret discussions this spring by the Administration in an effort to head off budget boosts. But it is doubtful that the program will have much effect. Indications are that Democratic congressmen will claim even this stepped-up timetable is inadequate in the face of recent Russian successes.

Expected arguments from scientists that money alone isn't the answer to space problems, but that scientific achievements must be built one on the other, will also probably not blunt the "rush" space program the lawmakers want started.

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Steel Going All-Out on Oxygen

Oxygen had a lot to do with boosting steel capacity by nearly 7 million tons in 1958.

You can look for it to play a still bigger role in the years ahead.—By G. J. McManus.

▪ Oxygen had a lot to do with the near-7-million-ton gain in U. S. steelmaking capacity during 1958. It will play an even more important role in the future.

American Iron and Steel Institute credited a "substantial" part of the capacity rise from 140.7 million ingot tons to 147.6 million tons to the use of oxygen in steelmaking furnaces.

Pouring It On—AISI was putting it mildly. After years of development work, the mills are now gearing up to really pour oxygen into openhearth furnaces. They are spelling out the benefits with facts and figures.

Here's what's happened in recent weeks:

1. United States Steel has indicated it is converting 25 pct of its steelmaking capacity to oxygen practice with openhearth roof lances.

2. A patent covering U. S. Steel's practices was allowed in late December.

3. Weirton Steel has reported record production of 104.9 tons an hour from an openhearth equipped with roof lances.

Throughout the steel industry there is a broad push toward volume oxygen and basic roofs for openhearths. The mills have found ways to apply oxygen through roof lances without sacrificing refractory life or suffering other penalties. They are pushing oxygen through overhead lances at the rate of 700 to 800 cu ft per ingot ton.

It Gets Results—Results have been impressive. Roof lances are boosting openhearth production rates 10-20 pct. They are enabling openhearths to run heats with as much as 80 pct hot metal.

The beauty of these gains is that they come with very minor equipment costs. An openhearth lance with auxiliary equipment can be installed at a nominal cost. Oxygen for roof lances averages about 45¢ an ingot ton at current rates of application.

It's Catching On — These considerations have brought general action. U. S. Steel is probably moving the fastest; it will soon have four complete shops on roof oxygen.

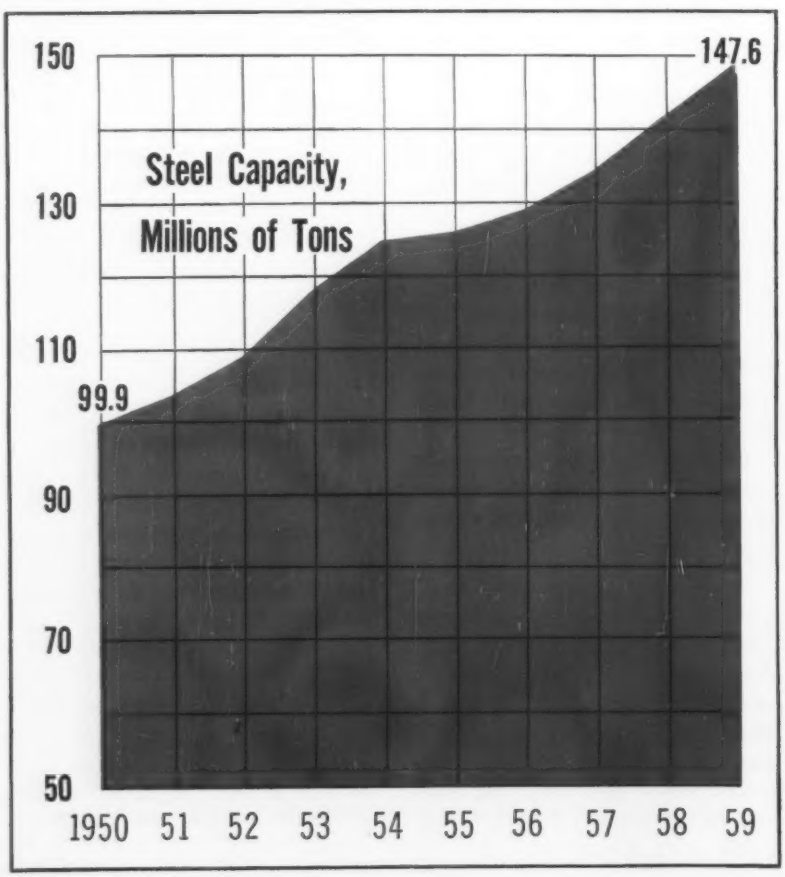
Jones & Laughlin has roof lances on two furnaces at Cleveland and on one at Pittsburgh. Weirton Steel has equipped four openhearths with oxygen roof lances.

Armco Moves—Armco Steel has roof lances on one openhearth at Ashland, Ky. A 120-ton (a day) oxygen plant was recently completed at Ashland. A 130-ton plant is going up at Armco's Middletown, O., works. Oxygen will be piped into the company's Butler, Pa., works.

Pittsburgh Steel has just installed an oxygen roof lance on a 225 ton openhearth. The mill can draw on a recently built 140-ton oxygen plant.

Bethlehem Is Cautious — There are some notable exceptions. Bethlehem Steel, for one, regards oxygen roof lances as still on an experimental footing. The sprung arch

Capacity: A Lift From Oxygen



basic roof is still in the planning stage at the same mill.

But the overall trend is clear. A short time ago, the mills were averaging about 200 cu ft of oxygen per ingot ton. In its recent record breaking heat, Weirton Steel used roof oxygen at the rate of 693 cu ft per ingot ton and combustion oxygen at the rate of 205 cu ft per ton.

Behind The Trend—Overall, the steel industry is turning to oxygen as a low cost means of increasing efficiency and adding capacity. The timing of the current spurt is the result of many factors. Improved market conditions have stirred interest in added production. Sintering and other moves have made more hot metal available . . . Weirton Steel has boosted its blast furnace output from 4800 tons a day to 6200 tons a day. More oxygen is available; the cost of oxygen is 5¢-7¢ per 100 cu ft.

Most important, possibly, the mills have finally worked all the bugs out of openhearth oxygen processes. Use of oxygen in openhearths goes back 15 years or more. Door lances were used initially in the late stages of low carbon heats. Applying lances to bring steel below 0.10 pct C reduced heat time about 30 minutes.

How It Started—In the postwar period, heavy general demand and the automotive need for deep draw sheets led mills to begin using lances at about 0.25 pct C. Heat times dropped another 15-20 minutes.

While these measures increased output, it was questionable whether they paid for themselves. Use of door lances was authorized by U. S. Steel only in times of peak demand.

During continued efforts to reduce openhearth steelmaking time, the present oxygen practice was discovered. In the early stages of its commercial development, the details of the new practice were closely guarded. By the second half of 1958, U. S. Steel was sure enough of its practice to begin showing it to outsiders. The open door policy was reinforced in December when a patent covering the system was allowed.

What Patents Cover — Patents cover things like oxygen velocity and muzzle design. According to U. S. Steel's Steve Jenks, the right combination of these and other elements make is possible to apply roof oxygen with maximum effect on the bath, minimum splash, minimum carryover to checkers, and no adverse effect on refractory life.

Oxygen application can start right after hot metal has been added.

Effect on Scrap—Administrative vice president-operations, Mr. Jenks feels the new practice increases the openhearth's flexibility with regard to scrap and hot metal. Fairless Works has run heats with 80 pct hot metal, 20 pct scrap. (Previous limit was about 70 pct hot metal). Mr. Jenks looks for hot metal usage to average about 5 pct higher with oxygen practice.

On the question of quality . . . "We can do a better job of controlling quality," he says.

The Basic Roof—The relation of oxygen to the new sprung arch basic roof is hazy. The past year has seen breakthroughs for both and there is a close association. But according to Mr. Jenks there is no essential dependence; the basic roof can stand on its own feet and so can overhead oxygen practice.

Big Benefits — Implications of openhearth oxygen are staggering. For U. S. Steel alone, the current push figures to add 1 million tons of steelmaking capacity. That's allowing for a conservative 10 pct gain in production rates.

The ultimate impact of oxygen may be even more startling. Percentage gains of 10 pct and 20 pct are based on normal working conditions, where cramped shops and overloaded handling devices hold back the oxygen charged furnaces.

Ideal Test Run at Weirton

Recently Weirton Steel set out to find out how fast an openhearth could produce steel under ideal conditions. It isolated one furnace from the rest of the shop, giving it the special attention of cranes and charging equipment. Oxygen was poured in. Results were as follows:

Production Rate.....104.9 tons per hour
Heat Time.....5 hours 35 minutes (tap to tap)
Heat Size.....585.9 tons
Charge.....86 pct blown metal (Weirton blows metal 10-12 minutes) down to 1.5 pct C to 2.0 pct C

Oxygen Use

Total.....898 cu ft per ton of steel
Roof lances.....693 cu ft per ton of steel
Combustion.....205 cu ft per ton of steel
Rate.....35,000 cfh initially; 40,000 cfh later
Number of lances.....3
Lance height.....6-8 in. above bath
Fuel.....6.5 gallons per ton of steel; 3825 gallons total

Tempo Changes In Venezuela

Venezuela is tired of dictatorships. It's on its way to democracy.

Now's the time to take stock of your business approach to this country. — By Tom Campbell.

▪ Venezuela is on her way—by a tough and painful but purposeful road — toward democracy. In her process of learning and undoing the effects of a long dictatorship some people may get hurt. And some of those who get hurt may be North Americans trying to do business in Venezuela.

The trend is Venezuela for the Venezuelans and for those of other countries who want to make Venezuela great. The recent flurry of tension over the increase in Venezuelan income taxes showed quite well that the nation's citizens are first Venezuelans. Even though they might have felt the Junta moved too fast and arbitrarily in raising taxes without negotiating with the oil firms, outside criticism did not go down well with anyone in the country.

(Oil companies claim that under the new tax rates their profits have been cut from 50-50 to 40-60 in favor of Venezuela. But private sources have told The IRON AGE that the net taxes paid by the oil companies had been around 57 pct instead of 50 pct.)

Understanding Needed—The big hurdle for North American businessmen will be coming up against a set of circumstances which may try even the most patient of businessmen. But that impatience is of a brand which stems from a lack of understanding by North Americans of just what the problems are in South America.

There is not now any real basic anti-American feeling. It can be aroused by irresponsible orators but President-elect Romulo Betancourt and all other political parties except the communists are pro-North American. The biggest job President-elect Betancourt—who is to be inaugurated soon—has is to get his country ticking again, cut down the debt left by the Perez Jimenez regime—and restore faith in the nation's ability to go ahead on her own steam. And he must keep the communists under control even though they will continue to infiltrate the government—and the unions.

Two-Way Street — Many North Americans who do business in Venezuela have their fingers crossed. But repeated failures of certain army factions to take over after the dictatorship had fallen has suggested a new movement in Venezuela.

It seems certain that those companies whose roots are down deep in Venezuela will make the grade. They are the companies who have rolled with the punches, made an attempt to live as Venezuelans and not as an isolated country club. By the same token, old hands in Venezuela know that that nation needs the North Americans as much as we need Venezuela. But this time a new factor has emerged.

We Lose, Others Win—Lack of proper relationship between Venezuela and nations north of South

How Important Is South America To U.S. Industry?

▪ Latin America is emerging as the largest foreign market for U. S. products. It has also become, since 1957, the major foreign supplier of raw materials to the U. S.

In the first nine months of 1958, U. S. industry exported goods valued at $3.3 billion to Latin America—higher than the amount shipped to any other area of the world. And the bulk of these exports was made up of items such as machinery, instruments, metal products, glass and ceramics, and chemicals.

Census Forecast — A growing population and a rapidly improving standard of living forecasts a tremendously higher rate of trade between North and South America. Population of Latin America is more than 170 million. By 1975, census experts say it will be close to 275 million.

It is estimated that by 2000 A.D., there will be 500 million persons in South America. That's twice the combined total forecast for U. S. and Canada in that year.

As a Supplier—Based on estimated growth of Latin America's productive capacity, economists predict that U. S. exports to Venezuela, alone, will total $7 billion by 1975. These forecasts paint a rosy picture for U. S. industry's export business.

On the other side of the ledger, Latin America is becoming an increasingly important source for U. S. industry of iron ore, oil, tin, and many other minerals. Iron ore reached an all-time high of 21.7 million tons in 1957 and 1958 totals promise to be even higher.

America has opened the door for West Germans, British, and Italian enterprise to make good where we fail.

Attitude Is Important—Secretary of the Treasury Robert Anderson endeared himself and his country to South Americans by his understanding of the need for the United States' joining an inter-American financial institution for development. In fact the stepped-up tempo of our relations with South America suggests a basic change in Washington's attitude toward our neighbors to the South.

But the strains and hard work needed in making democracy work in Venezuela may be painful to many North American firms. Old timers have told this writer that the future potential in Venezuela is unsurpassed in any other South American country. But the need for more education, better housing, more industries besides oil and iron ore suggest a tough fiscal policy will be needed if inflation is to be kept in check and Venezuela's credit kept at its high rating.

How to Make Friends—Friends of North Americans have suggested the following to those who would get in on the ground floor of the "new" Venezuela:

—Learn some Spanish.

—Work for Venezuela as well as for the company you are with.

—Do not isolate yourself in a colony where nothing of Venezuelan problems or ideas touches you.

—Use a little forebearance in your dealings with Venezuelans while they are adjusting to a democracy.

—Be discreet in your remarks about the country you are in.

—Don't expect to get rich over night because you are in a foreign country.

—In your dealings with Venezuelans treat them as equals not as people you don't quite understand.

—In your business deals don't fall for all the talk about bribes and special kick backs; act and deal as you would at home.

DAVE MCDONALD: "I certainly don't want a shutdown in steel . . ."

Steel Labor Chief Woos Public

▪ United Steelworker chief David J. McDonald last week attempted to step out from under responsibility for any work stoppage that may follow the ending of union basic steel contracts on June 30.

After a Chicago meeting of the Steelworkers executive board, Mr. McDonald told newsmen: "I certainly want to get an agreement and don't want to see a shutdown in the basic steel industry." He said it would be a sad mistake for the industry to "force" a shutdown of production at this time.

Union Demands—The Chicago session shed little light on what the union will demand. Mr. McDonald said unemployment was still a problem in the industry. And last month he issued a statement that employment was lagging behind the steel industry recovery.

This line of comment has stirred speculation that a shorter work week may be a major plank in the union's platform. The Steelworkers have indicated interest in greater insurance and health benefits.

Still to Be Done—At the Chicago conference, Mr. McDonald said union demands have not been formulated, and won't be until the union's wage-policy meeting. No date has been set for this. He also said there has been preliminary talks with steel companies on the mechanics of negotiation. But again no dates have been set.

The Chicago session did make one thing clear. Coupled with other recent Steelworker moves, Mr. McDonald's remarks indicated this year's talks will be preceded by a strong appeal to the general public.

Grass Roots — The union will launch a nationwide advertising campaign on the theme: More pay means more buying power. A new 15-minute radio series, will run 26 weeks. And the Steelworkers are continuing their monthly television meetings.

Why Zinc Industry Is Confident

Zinc producers are enthused about market prospects for their product in '59.

Galvanized sheet shipments are booming. New automotive applications are promising. And zinc diecastings remain a solid source of sales.

▪ Zinc producers are entering 1959 with fresh optimism.

The outlook for most major markets is bright. It is possible new uses could push demand above supply if they develop.

Galvanized Boom—Galvanizing, which represents 40 pct of the total zinc market, continues as the major consuming classification. Industrial and construction orders for galvanized steel sheet have risen so far in recent weeks mills were forced to lengthen delivery times.

Growth of galvanized sheet use has been dramatic. In 1948 mill shipments were under 1.65 million tons, while final 1958 figures should easily pass 2.65 million. And industry sources are confidently talking of annual shipments of four million tons by 1965.

Bigger Market Slice — Tonnage figures do not tell the whole story. Galvanized sheets as a percentage of total steel shipments have been rising for some years. In 1948, galvanized was 2.5 pct of total steel shipped. In recent months it has been running over 5 pct, and probably finished 1958 with a year's average of about 4.7 pct, according to the American Zinc Institute.

Principal galvanized markets are steel service centers, construction, automotive, and agricultural including farm machinery.

Their relative importance is indicated by American Iron and Steel Institute shipment figures for 1957: Service centers, 748,317 tons; construction, including contractors' products, 980,230; automotive, 124,196; and agriculture, 103,548 tons.

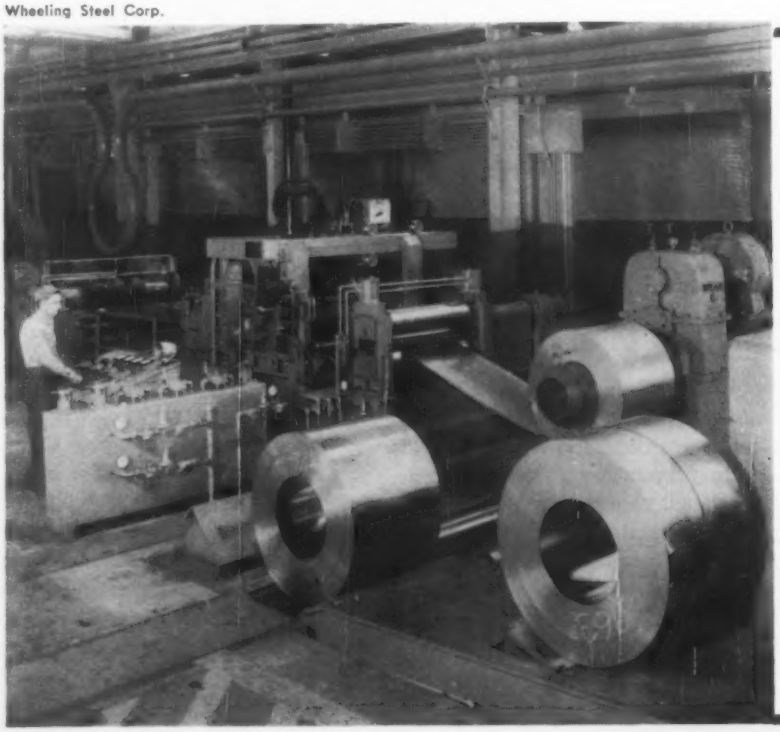
Behind '58 Gains—In 1958, after a dull first half, galvanized shipments gained sharp momentum. The principal spurs were construction buying and active farm and farm equipment markets.

Now automotive orders are accelerating with the rising rate of car production.

Even better news from Detroit is hoped for in the near future. This centers around development work on new types of body construction which would use very large tonnages of galvanized sheet steel, primarily on the underside of the auto. This market, if it develops, as galvanizers hope, could seriously strain existing production capacity.

Aluminized Threat?—Aluminum-coated steel is sometimes mentioned as a possible threat to galvanized. But both zinc producers and galvanizers minimize this competition. Instead, they indicate surprise that aluminum-coated sheet was not used more extensively earlier for higher-temperature applications unsuitable

Wheeling Steel Corp.



Galvanized Sheet: Big Zinc Market

Shipments (Net Tons)

1955	2,864,000
1956	2,958,000
1957	2,393,000
1958	2,650,000*
1965	4,000,000*

*Estimated

for galvanized.

They expect that aluminum coated will probably carry a substantial price premium for some time to come. And they stress that aluminum coatings are less effective than zinc for corrosion resistance in many applications, despite aluminum's higher stand in the Galvanic table.

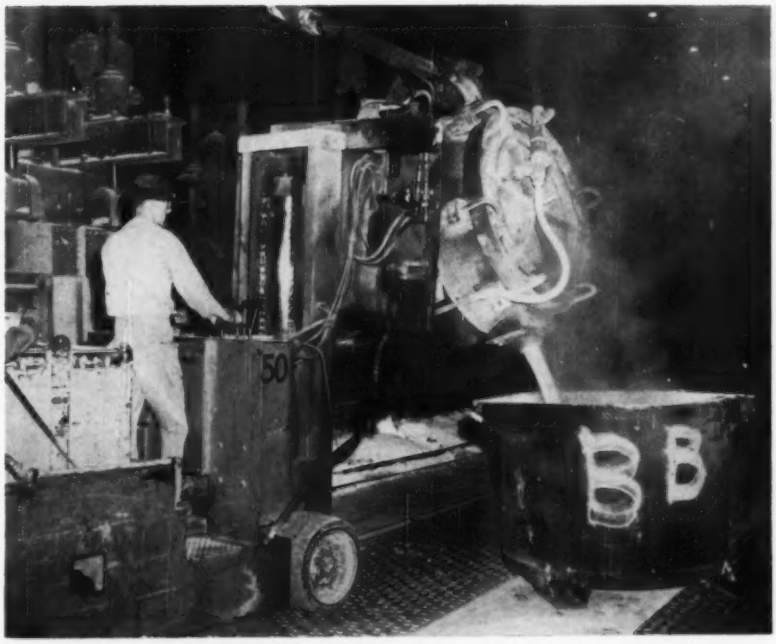
Automotive Market—The automobile should also bring higher business to hot-dip galvanizers in 1959 via the Federal Highway Program. This market should consume sizable quantities of zinc for hot-dip galvanizing of guard rails, culverts, sign posts, lighting systems, and bridge and tunnel components.

Detroit also raises hopes for higher zinc discasting sales. Diecasting alloys account for almost as much zinc sales volume as galvanizing, and the 99.99 pct zinc used for these alloys commands a higher price than galvanizing metal. Since a majority of diecastings go to the automotive market, the health of this industry is important to zinc producers. The AZI reports that most 1959 autos carry more zinc than corresponding '58 cars. And zinc producers look for further increases in future model years.

Chrome Problems — Diecasters admit there has been some temporary disillusionment with chrome-plated brightwork, a major automotive use for zinc diecastings. Prime reason for this is unquestionably substandard plating during periods of nickel shortages. A variety of other factors have also had their effect, however, including increasing use of salt on highways during freezing weather.

But new plating research programs by interested industries have produced important advances in the art. As a result a major breakthrough in plating techniques appears likely.

Development of a satisfactory coloring process remains a major obstacle to expansion of zinc diecastings in many markets. But research is going forward.



HOT METAL TRANSFER: A 5-ton Elwell-Parker electric truck hauls crucible of molten aluminum from furnace to ingot casting machine at Anaconda Aluminum Co.'s reduction plant, Columbia Falls, Mont.

Trucks Haul Heats

▪ Industrial trucks are pushing their way into new material handling jobs in aluminum and copper plants.

They are taking a load off cranes in aluminum reduction plants by feeding ore into reduction cells and removing hot metal for pouring into pigs. Overhead crane traffic is cut down and cranes can be concentrated on adjusting anode heights in reduction cells.

Side-Loading Cells—In a New York copper plant, a king-size ladle truck is used to eliminate a casting and remelting cycle. The vehicle carries and pours 15 tons of molten copper between primary and secondary refining baths.

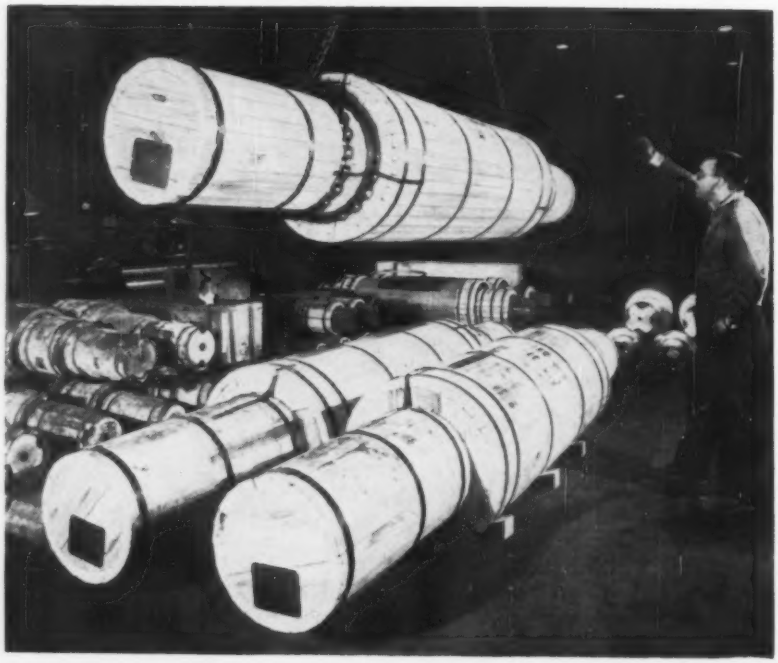
First major use of trucks for handling alumina was Anaconda Aluminum Co.'s 60,000-ton-per-year reduction plant at Columbia Falls, Mont. This plant, which started production in 1955, uses the Pechinet reduction process. It involves cells with vertical instead of horizontal anodes. The cells can thus be side-loaded at floor level by trucks.

Others to Follow—A fleet of 14 special electrical trucks furnished by Elwell-Parker Electric Co., Cleveland, handles the loading of the cells with alumina and briquettes. They also tap the cells and carry off hot metal in ladles for pouring.

A similar system using the Pechinet system and trucks will be used at Harvey Aluminum Co. reduction plant at The Dalles, Ore., and at Aluminum Co. of Canada plant, Kitimat, B. C.

Battery Powered—All trucks at the Anaconda plant are special because of the size and delicacy of the jobs handled. They have a speed range from about ½ mph to 5 mph.

A Ton of Protection



HANDLE WITH CARE: When steel mill rolls made by the Warwick, W. Va., foundry of Blaw-Knox Co. are sent overseas they are packaged in about 2000 lb of protective material. A coat of grease prevents the precision rolls from corroding. Then comes a wrapping of thin, non-acid paper, a layer of waterproof paper strapped in place, and finally wood lagging tapered to the contour of the roll strapped snugly in place.

Military Called Misers On Tool Replacement

A congressional "watch dog" committee is demanding the military spend more to keep their machine tool stocks modern and efficient.

The Senate-House Defense Production Committee is irritated at what it calls the failure of the services to use funds provided for machine tool replacement.

Take Action — Although noting the shift in planning from a 5-year to a 3-year war has brought a re-evaluation of machine tool needs, the committee still insists Defense Secretary McElroy should "take the necessary action to insure that each service makes adequate provision" every year for modernizing tool inventories.

National security demands, the committee adds, that the services keep their inventories "modern and reduce overall costs by taking advantage of advanced efficiency and increased productivity of new and improved machine tools."

Military Tool Spending — The Army, in the fiscal years ending in June 1958, and June 1959, failed to obligate any money for machine tool replacement. The Navy and Air Force have done little better. In fiscal 1958, the Air Force budgeted an ambitious $33 million, but committed only $1 million. In fiscal 1959 the Air Force budgeted $20 million.

In fiscal 1958, the Navy budgeted $16.7 million, and spent $7 million for tool replacement. In the current fiscal year, the Navy has budgeted $21 million.

For 1954 through 1956, Congress appropriated some $450 million for military machine tool replacement. But only a paltry $15.4 million was ever spent, the committee reports.

Reds Buy Steel, Sell Chrome Ore in U. S.

Russia has purchased 20,000 tons of cold-rolled steel in the American steel market—presumably to make automobiles and other civilian products.

Last fall the Russians were trying to buy 25,000 tons of stainless sheets, and a quantity of 40-in. diam linepipe in the U. S. Neither deal has yet gone through. Apparently the Reds are still interested in buying a tube mill, and mills for rolling tinplate.

Transaction — The cold-rolled sheet buy, made through a New York export broker, also calls for shipment of 80,000 tons of Soviet chromium ore to the U. S.

According to the broker, Ara Oztemel, president, Greg-Gary Corp., the steel was made by Republic Steel Corp.

Who—Mr. Oztemel would not identify the American concerns buying the chromium ore. He called the transaction a "counter-purchase." Money actually changes hands in payment of each order, but one order would not have been obtained without the other.

Small Business Loans

The first small business investment companies—formed with government aid to provide equity capital and make long term loans to small concerns—will be open soon.

Officials of the Small Business Administration, which licenses and finances the new institutions, are now processing the first half-dozen applications.

How It Works—Under the law, passed last year, the government matches the amount raised by private sources. There is a $150,000 minimum, but no maximum. Banks, insurance firms, businessmen, and investors are forming the new firms.

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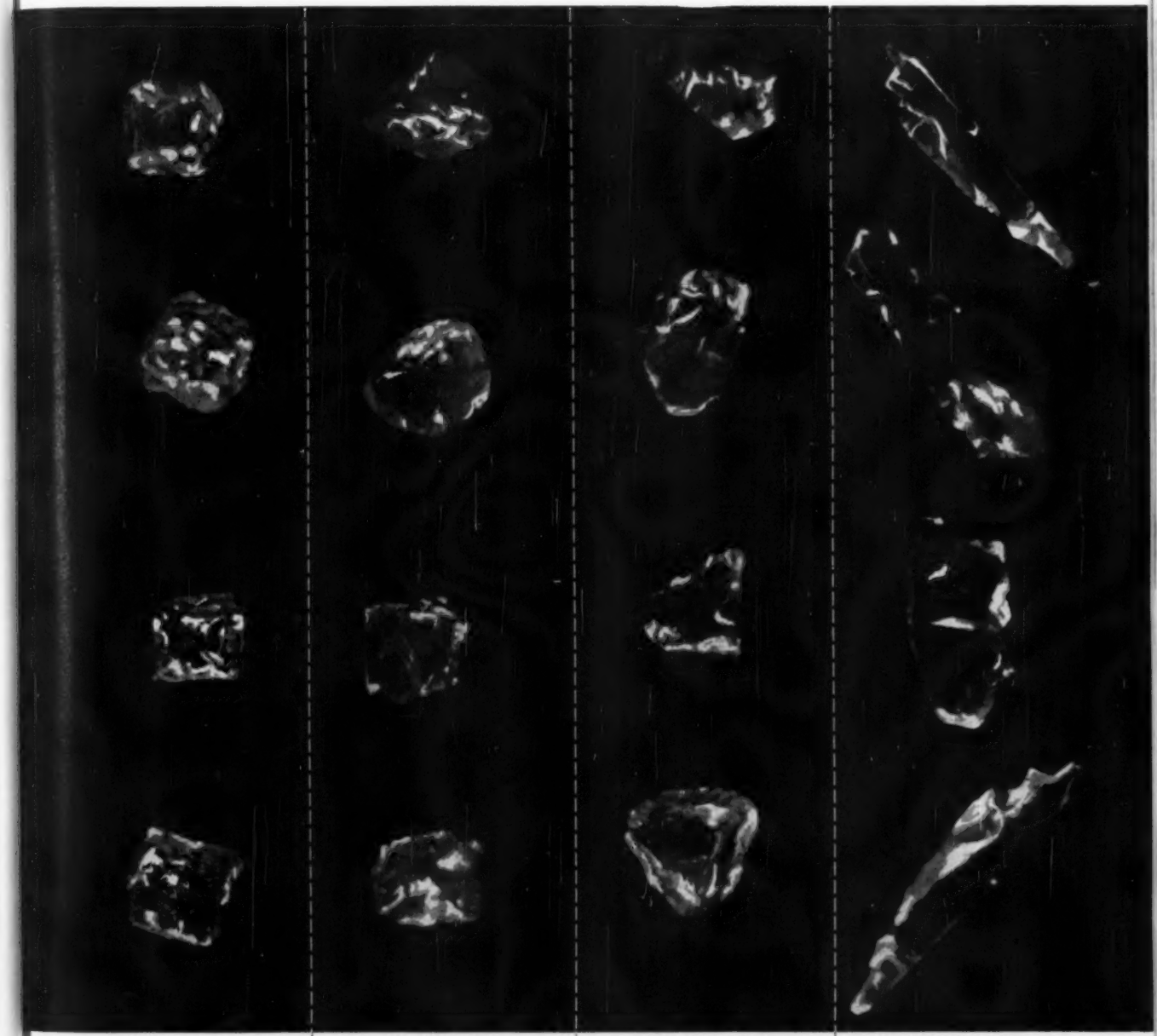
FOR EFFICIENT GRINDING



No. 1—Cubes | No. 2—Blocks | No. 3—Irregular Blocks | No. 4—Needle Grains

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When natural diamond is crushed by our controlled methods, four mesh shapes are generated: No. 1 (Cubes); No. 2 (Blocks); No. 3 (Irregular Blocks); No. 4 (Needle Grains).

Increased grinding efficiency can be obtained by using mesh sizes with a controlled shape distribution.

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Complete engineering and manufacturing service: including design and development of special machinery, mechanical products and spring actuated mechanisms. Stress analysis, spring design, metallurgical data, heat treatment, plant layout, engineering reports, selection of materials and equipment. Tools and products.

August 1, 1958

The American Brass Company
414 Meadow Street
Waterbury, Connecticut

Gentlemen,

SUMMARY OF ENGINEERING LABORATORY REPORT No. 8158

SUBJECT: Fatigue Life and Endurance Limit testing of; "DURAFLEX" Superfine-Grain Phosphor Bronze and Commercial Quality Phosphor Bronze, 5% (A) spring quality strip material.

SPRINGS: Flat spring strip was made into the usual type of contact springs used in switches, relays and instruments. These springs were deflected at about 1 cycle per second in a specially built fatigue testing machine and the deflections recorded.

STRESSES: The springs were deflected from the initial free position of zero stress to a final position having a bending stress of 77,000 p.s.i.

This stress, for phosphor bronze strip is unusually high and is higher than stresses ordinarily recommended for Beryllium-Copper or Stainless Steel for such severe service.

RESULTS: Commercial Quality Phosphor Bronze, 5% (A) springs acquired a permanent set quite early and broke at an average number of deflections of 453,374.

"DURAFLEX" springs were still satisfactory, showed no permanent set, no loss of load and no breakage at 4,000,000 deflections.

CONCLUSION: Design stresses for "DURAFLEX" can be at least 50% higher than the stresses for Commercial Quality Phosphor Bronze, 5% (A) as shown in the TOOL ENGINEERS HANDBOOK.

Respectfully submitted,

THE CARLSON COMPANY

Harold Carlson

Harold C. R. Carlson, P.E.
Licensed Professional Engineer

HC:R

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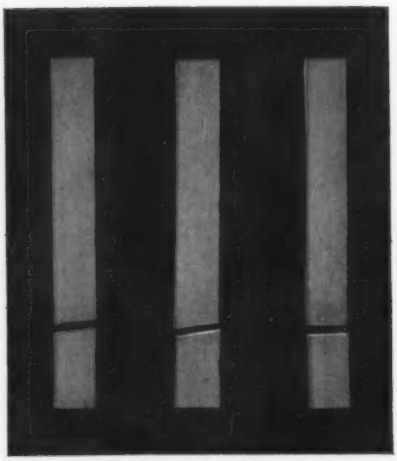
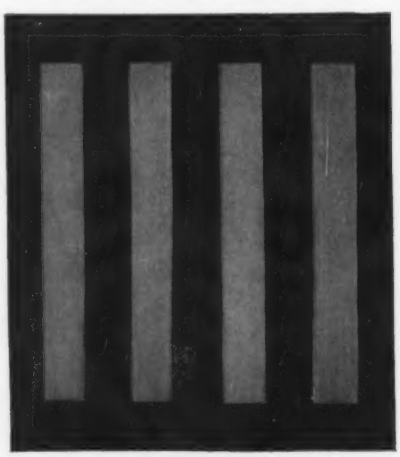


THREE SPRINGS of regular Phosphor Bronze, 5% (A), actual size, took a permanent set at about 200,000 deflections and fractured at an average of 453,374 deflections.



FOUR SPRINGS of Duraflex Superfine-Grain Phosphor Bronze, 5% (A) were still satisfactory after 4,000,000 deflections.

DURAFLEX, available in Phosphor Bronzes (A), (C) and (D), in strip and wire, offers a host of opportunities to cut costs while maintaining or improving quality and performance. For further information and technical help to select the alloy to meet your needs—call in your American Brass Company representative, or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

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SUPERFINE-GRAIN PHOSPHOR BRONZE
A product of
ANACONDA®
Made by The American Brass Company

Harold E. Renaud

Plastic Tooling Is His Mission

A former patternmaker who knows his materials, Mr. Renaud is sold on epoxy resins.

He would like to clear up some misconceptions about the reliability of plastics.

▪ Forty years ago—in the days when it was a popular ambition among young men to "learn a trade"—a youth named Harold E. Renaud set his sights on becoming a patternmaker. To say he hit his mark would be an understatement. Today he is president of his own firm, Ren Plastics, Inc. of Lansing, Mich., a leader in production of epoxy resins and a pioneer in plastic tooling.

An Interested Observer—During 25 years with Ford, General Motors styling center, and Oldsmobile Div., Mr. Renaud learned his patternmaker's craft thoroughly and he also grasped the significance of another type of pattern—the pattern of change.

He watched with interest while production methods changed from the old carriage makers' ways to new concepts of mass production. He saw auto body materials change from part wood and steel to all-steel construction. The clay model, now such an integral part of a design and styling program, came into use while he was with the GM styling center.

Makes His Move—By the time plastics appeared as a likely automotive material, Harold Renaud was ready to move out on his own. In 1942, he organized Ren Plastics and delved into a new concept in materials and tooling.

HAROLD E. RENAUD: Plastic tools are part of the pattern of change.

"The use of plastic tools and tooling," Mr. Renaud asserts, "is part of the pattern of change that constantly takes place in American industry. Plastics give us another material with which to accomplish our goals in tooling with greater speed and accuracy."

Specific Reasons—Cost savings in tooling are time savings, he says, because about 95 pct of tool costs are labor hours. The development of epoxy resins has provided material that is fast and easy to work with cutting labor hours significantly, he adds.

Mr. Renaud also envisions additional savings through use of plastic tooling as a "three-dimensional" blueprint to eliminate double engineering.

An Obstacle — One immediate problem that the plastics industry must overcome, says Mr. Renaud, is failure of many people in industry to recognize that epoxy resins have a tremendously wide range of properties. No one, for instance, would expect a soft, leaded steel to do the same job as the hardest tool steel. Yet, such differentiation is not made with plastics in the minds of these same people, he points out.

Mr. Renaud has "great faith in the ability of tool engineers to make the most of epoxy resins."

How a leading automotive manufacturer Snyder-izes for the Soaring Sixties

HOLDS PISTON WEIGHTS ± 2 GRAMS AT 600 PER HOUR

This Snyder transfer machine automatically weighs die cast aluminum pistons and mills them to tolerances of ± 2 grams at double the rate of the previous method. Here's how it turns out 600 parts per hour:

Pistons are transferred bottoms-up to orienting station.

Pistons are oriented in relation to the wristpin hole offset.

Pistons are spun right side up (below at right) while they are advanced to weighing station.

Precise overweight is transmitted by memory system to weigh-mill station during transfer.

A 3¼" milling cutter removes excess with the piston clamped in position.

Gaging station re-weighs pistons to check weight. Deviation from part tolerances stops machine.

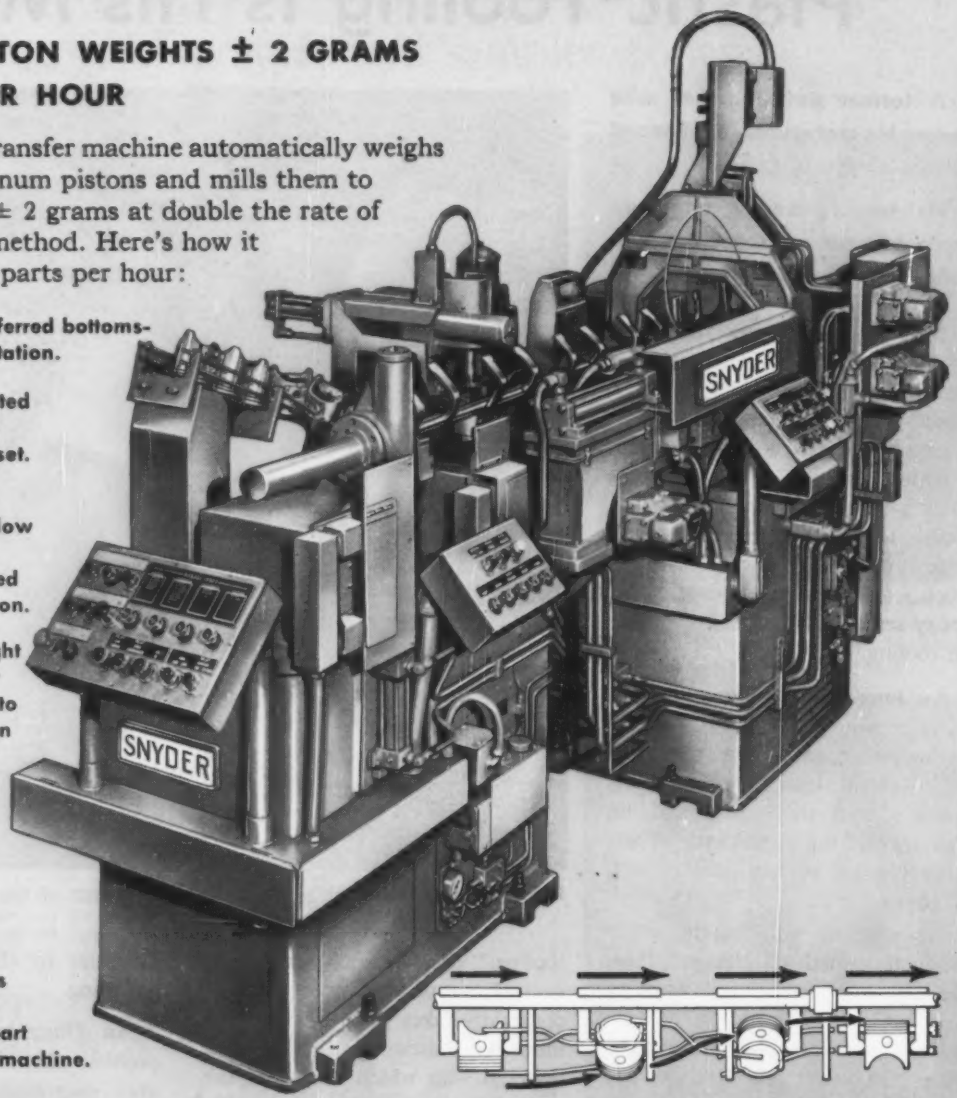

Diagram shows end over end rotation of piston as it passes through spiral rails.

Do your manufacturing cost problems revolve around parts handling, gaging and assembly as well as machining? Ask us to show you the benefits of SNYDER-IZING FOR THE SOARING SIXTIES. For a resume of SNYDER special machines engineered for profit opportunities, send for our new brochure or phone.

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Is Business on the Defensive?

Anti-business sentiment is not as strong as it might appear to be from early reports.

Many critics lack influence and a lot of public opinion is swinging toward the business side.

▪ On the surface, it looks like business is in for a long period of being on the defensive.

It will be under attack from labor, the trust busters, and a Congress that threatens to take off after business on everything from taxes to prices. All in all, it looks like a pretty unfriendly world to the business executive.

Why Now?—On top of that, business is just emerging from a recession that could have developed into a full-scale depression. For most metalworking firms, the sales figures are just getting back to a respectable level and it seems a little unrealistic to have to defend their position so soon.

But there are two consolations for a realistic businessman. One is that "it was ever thus," and the experienced executive, however much he may hope for a reprieve, has been through all this before.

Secondly, this is the time of year when the anti-business group makes all of its noise. When it comes to facing the issues, extremists will not be in the positions of authority and their policies aren't likely to prevail.

Business Baiters—This is particularly true in Congress, where there are the professional business baiters who owe their elections, or think they do, to promises of investigations, probes, hearings, and what not. Refreshed by the recent elections, the noise is a little louder this year, true.

However, there is no real anti-business mandate to Congress. In fact, the general public is a little more sympathetic to business problems than it was two, or even four years ago.

Tough Laws Now — Another point: There are some pretty strong laws on the books now that affect industry and it's unlikely that any new restraints will be placed on doing business. There's no point to hope for favors, but there is no need to run for cover.

Most leading executives believe that the worst possible thing for business to do this year is to take too much of a defensive position.

In the past two years industry representatives have made a good impression before Congressional committees where they have stated their position in a forthright manner and challenged misrepresentation and half truths when they could.

Labor Also Defensive—On the labor front, the public is still alert to the revelations of the McClellan committee. Even if no legislation comes of it, it has put labor on the defensive more so than business.

Wage negotiations are a tougher obstacle than Congress, but even here there is hope. There have been some serious strikes in recent months, from automobile to the airlines. It's significant that there was very little public clamor for settlements that favored the union entirely.

In fact, companies that have stood their ground are getting more public support than probably is apparent to those on the spot.

Durables Pace Sales Gains

▪ Those critical business factors, new orders, sales, inventories, and backlogs, all continue to look good.

November figures show manufacturers' sales up to $27.6 billion, with most of the improvement in durable goods. Manufacturers' new orders did not show an overall improvement in the month. This is because a modest improvement in the durable goods industries was offset by a slight drop in nondurables.

Orders Lead Sales—New orders continue to exceed the rate of sales, a significant trend characteristic of all business upturns. The result is a small lengthening of manufacturers' backlogs.

Another significant point is that inventories continue to hold at a low level, in spite of general attempts to build up stocks to more workable levels by most industry.

Dept. of Commerce reports, for manufacturers, new orders in November at $27.9 billion, seasonally adjusted, new sales at $27.6 billion.

Auto Paper Picks Up Instalment Debt

Instalment credit continues to edge up, reflecting the upturn in consumer confidence.

Principally on the strength of new auto paper, instalment debt rose to $33.1 billion at the end of November. It was the second consecutive monthly gain.

Instalment debt is still $440 million below the total a year ago. For the first time since December, 1957, consumers took on more auto paper than they retired.

Accurate casting of this 40-lb. rear end housing cuts machining at Auto Specialties.

Quality Controlled HANNA SILVERY... Simplifies Consistent Production of Quality Controlled Castings at Auto Specialties

Much of Auto Specialties Manufacturing Company's fine reputation has been built on the high quality malleable castings produced in huge quantities at its St. Joseph, Michigan, foundry. An important factor in this continuous high quality story is the use of Hanna Silvery. Its dependable analysis plays a major role in the close silicon control of cupola-electric furnace duplexing of malleable, so necessary in the manufacture of precision automotive parts.

Whether they are housings or gears, sprockets, universal joints or clutch plates, quality controlled Hanna Silvery is of vital assistance in maintaining the exacting chemical composition necessary to production of precision castings time after time. This record is substantiated by a million-volt X-ray machine, a part of Auto Specialties quality control system, which spot checks castings for uniformity and accuracy.

Hanna produces high quality pig iron for every foundry need. All regular grades, plus close-grain HannaTite, are available in 38-pound pigs and HannaTen ingots. Trained representatives are ready to help with your metallurgical problems. For assistance, call Hanna today.

Millions of perfect castings at Auto Specialties pass under the eye of this X-ray machine.

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Chrysler Reports on Turbines

Day of Decision Is Not Too Far Off, Huebner Says

In a few years, automakers will be able to choose between piston or turbine engines.

Materials and design bottlenecks are being overcome rapidly.—By H. R. Neal.

▪ During the past year, automakers have been whittling away at the mountain of problems posed by gas turbine engines. It now appears they'll be able to decide within a few years when, or if, future automobiles will be powered by gas turbine engines.

This week Chrysler Corp. issued its latest progress report. George J. Huebner, executive in charge of research, said more progress has been made within the past two years in the development of the firm's experimental gas turbine engine than during all of the preceding years of work on the project.

NEW TURBINE MATERIAL: An experimental material (left) developed by Chrysler has successfully passed tests for use in gas turbine engines. After exposure to heat above 2000°F for 150 hours, the material showed no signs of disintegration, while effect on stainless steel (right) is apparent.

Worst Is Over—"The remaining technical and engine development problems do not appear nearly as difficult or complex as they did even two years ago," Huebner said. "There is no doubt that we are close to the time when automotive manufacturers will be able to choose between reciprocating engines and gas turbines."

Why is the Chrysler research chief so optimistic? Because of Chrysler's progress in two "significant" areas — engine design and metallurgical research.

Supply Problem — For a mass production industry, such as the automotive field, manufacturing techniques and existing materials used in aircraft jet engines won't work. Cost is one reason. Then there is neither the production capacity nor the supply of such metals as cobalt to support even a modest automotive gas turbine production program, Mr. Huebner points out.

A key to Chrysler's most recent progress can be found in this statement: "It has been necessary to develop new materials—the right combinations of plentiful and relatively inexpensive metals — which would do an equally good job."

Mystery Material — Huebner credits extensive research by Chrysler metallurgists with developing a material suited for use wherever great resistance to heat and oxidation are required, and where only moderate strength is needed.

"This new material," he explains, "contains none of the critical elements, it is very ductile, and can be rolled, cast, forged and formed at the normal working temperatures of steel. It has excellent resistance to oxidation at temperatures above 2000°F for continuous operation, and withstands even higher temperatures for shorter periods."

Another Under Test — Some areas of the gas turbine engine where this material would be used (and presumably are being used) are combustion chamber liners, hot gas passages and other non-moving parts in the turbine section.

For moving parts another high temperature material has been de-

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20 YEARS OF SUCCESSFUL EXPERIENCE with ***ZAMAK*** alloy die castings have led Neptune Meter Company engineers to use 40 or more such parts in some models of their AUTO-STOP PRINT-O-METER REGISTER.

This direct-reading register for liquid meters is a perfect example of complexity made simple by the use of pressure-cast zinc alloy. Notice the many as-cast features in these parts: bosses, studs, cored holes, lettering, strengthening ribs and even inserts of other materials cast in place. These parts are ready for assembly with a minimum of machining, and at a saving of production costs.

These assembly advantages resulted from intelligent design. They can be adapted for your products as well — along with the natural durability and corrosion resistance of ***HORSE HEAD® ZAMAK*** die casting alloys.

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HORSE HEAD PRODUCTS ®

Automotive Production

WEEK ENDING	CARS	TRUCKS
Jan. 10, 1959	133,567	21,837
Jan. 3, 1959	97,664	13,837
Jan. 11, 1958	120,140	17,928
Jan. 4, 1958	76,653	12,704
TO DATE 1959	168,300	23,000
TO DATE 1958	166,892	26,370

*Preliminary Source: Ward's Reports

veloped, but isn't quite fully tested. "But it looks very good to us," Mr. Huebner states.

A Little of This—"Typical applications for this new material would be in turbine wheels and buckets. It has the strength, dimensional stability, and heat resistant qualities of the super-alloys used in military turbo-jet engines. It is as easy to weld as the super-alloys, but is less brittle. But it contains no cobalt, and only a tiny amount of nickel and just a pinch of this and that."

While he wouldn't reveal what "this and that" is, he says it is "readily available" under normal conditions and "fairly available" under war-time conditions.

Weight Advantage — The odds are good, he said, that within two years Chrysler's experimental gas turbine will contain no more critical or strategic material than are currently being used in many consumer durable goods.

Why are automakers interested in gas turbine engines? One reason is the weight advantage. "The engine will probably weigh about 450 lb—some 200 lb less than our first turbine, which did not have as much power," says Mr. Huebner. "It will be almost 400 lb lighter than present day V8's. It will retain a significant weight advantage even though larger amounts of lightweight metals are used in future piston engine designs."

Easier on Gas—Engine efficiency has also posed problems in gas turbine engines, but design improvements have helped correct them.

As evidence of gains in engine efficiency, Huebner disclosed the results of a recent 576 mi. economy test run in which the turbine averaged 19.39 mpg at an average highway speed of 38.3 mph.

Installed in a 1959 Plymouth, the latest experimental power plant improved substantially on the 13 to 14 mpg registered by an earlier unit on a cross country run two years ago.

Turnpike Test — The economy run was made from the Stony Ridge (Toledo) interchange of the Ohio Turnpike to Woodbridge, N. J., over the Ohio, Pennsylvania and New Jersey turnpikes. Diesel fuel was purchased along the route.

Huebner points out gas turbines have poorest efficiency at low speeds and under part-load conditions and gave this as the reason "we chose to loaf along at 35 to 40 mph."

Fuels Switched—A 618 mi return trip was made from Highstown, N. J., under slightly different conditions. The experimental engine ran on four kinds of fuel—diesel fuels, turbo-jet fuel, clear and leaded gasoline. Continuous use of leaded gasoline isn't recommended for the gas turbine, however.

Huebner says the improvement in fuel economy is due directly to progress in three areas—compressor, burners, and regenerator.

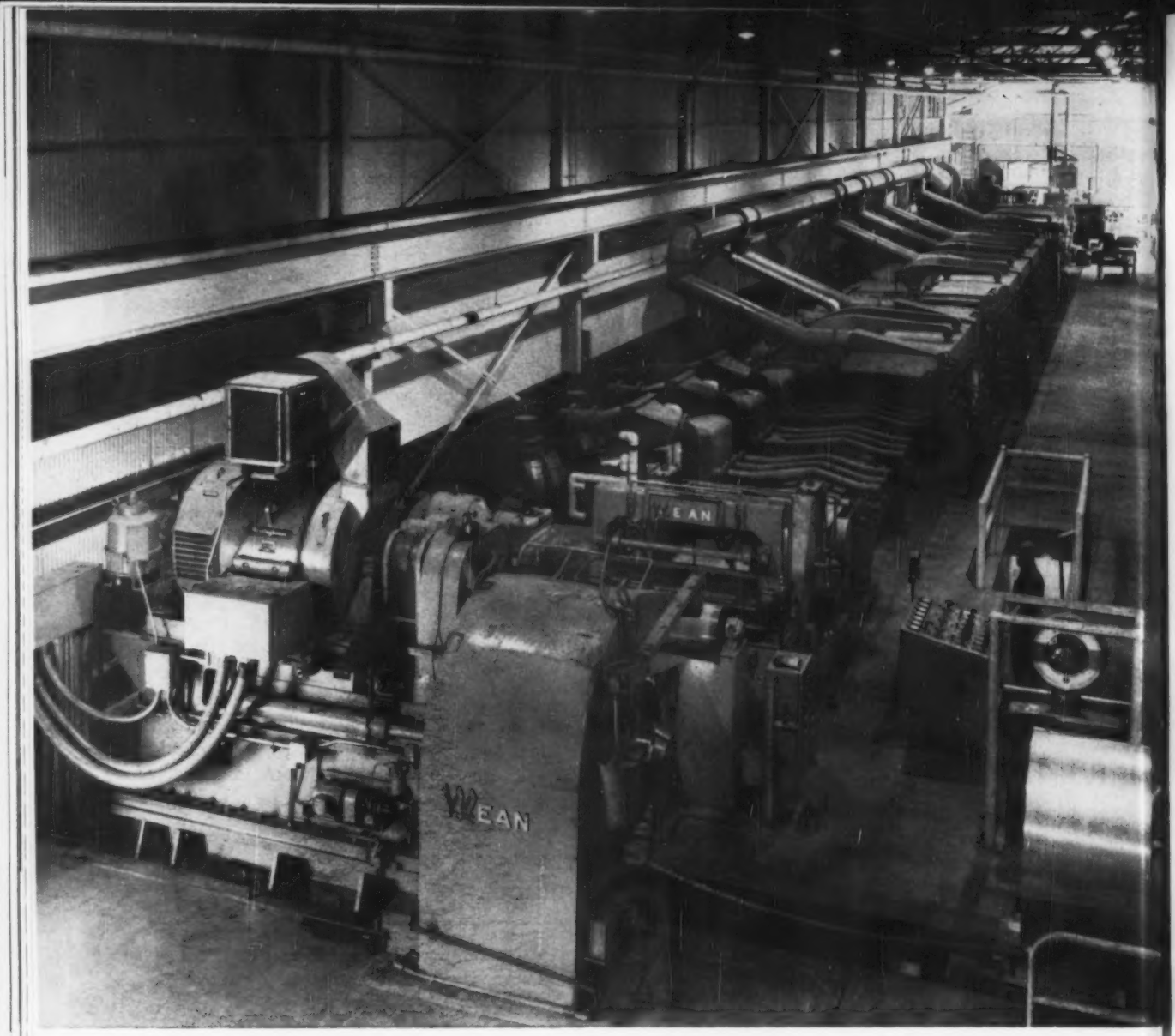
Principal advantages claimed for gas turbine engines are: Servicing should be easier, fewer parts would have to be kept in inventory, considerably lighter weight, practically no vibration, no cold starting problems, no need for anti-freeze and—it's a multi-fuel engine, operating on "anything that will flow through a pipe and burn with air."

Problems Remain — However, some questions still need answers.

"How much will reciprocating engines be improved during the next few years?" and "Assuming necessary new production techniques and equipment could be developed, would gas turbines be more expensive to manufacture in quantity than reciprocating engines?"

The Bull of the Woods

ONE OF US WILL TAKE CARE OF IT, DAVE--YOU WAIT HERE NOW, DAVE--LISTEN!
NO--I'LL SEE HIM MYSELF! YOU WOULDN'T UNDERSTAND THIS!
THAT'S TH' CURSE OF TALKIN' TOO MUCH WHEN YOU'RE JUST ONE OF TH' BOYS! HE'D SAY, "BOYS, IF I EVER GET BIG, MY OFFICE WILL ALWAYS BE OPEN TO YOU!"
THERE'S A LOT OF 'EM LEFT YET AN' NOT ONE PAYS ANY ATTENTION TO TH' BULL'S FRONT MEN!
REPAIR ORDER CRANE NO 10112
"THE PROMISED LAND"
T.M. Reg. U.S. Pat. Off.
© 1959 by NEA Service, Inc.



Wheeling Steel cleans tin plate faster, more efficiently with Wean Line

The new Wean tin plate cleaning line at Wheeling Steel's Yorkville plant is an excellent example of modern electrolytic cleaning techniques. Grid-type current application above and below the moving strip permits line speeds to 2000 feet per minute with complete palm oil removal. Through Wean's tension-type design, with automatically controlled "floating" mandrel, accurate strip tracking is assured at all line speeds. This design also eliminates the floor space previously required for exit-end looping. Coils up to 24 tons, in widths from 18 to 45 inches and all usual tin plate thicknesses, can be handled by the line.

Wean has pioneered in the design and development of electrolytic cleaning processes: has built 80% of all lines in use today. This experience plus Wean's *creative engineering* ability can benefit you, whatever your requirements for continuous steel processing lines.

WEAN

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Defense Spending Will Climb

"Spenders" Will Scuttle Ike's Economy Efforts

Cutting defense costs is easier said than done, say Capital insiders.

Congressional pet projects may raise military spending to $42 billion.—By G. H. Baker.

▪ Defense spending, despite President Eisenhower's hold-the-line efforts, is to climb by about $1 billion in the new fiscal year. Again, the emphasis will be on missiles and exploring space.

This means an overall military budget of around $41.8 billion for the year beginning July 1. And the final total may be close to $42 billion. For many congressmen are determined to add pet spending projects of their own to the defense budget, thus pushing the total to an unprecedented peacetime high. (See page 41).

It's Not Easy—A look at Mr. Eisenhower's proposed military budget shows that he is making a conscientious effort to weed out obsolete spending projects in order to release available dollars for high-priority programs involving missiles and exploration of space. But this is easier said than done.

Every congressman with a defense plant in his district is resisting efforts to close out procurement programs involving pre-nuclear age weapons. And the politicians are tacitly backed up in this resistance program by thousands of Pentagon supply officials who are not anxious to close out their comfortable assignments. In government, just as in industry, it's far easier to keep on doing what you're doing than to break new ground.

Inflation Factor—In recent years the cost of national defense has been rising by a chunky $1 billion a year. Part of this rise is due to advances in technology and part is due to inflated procurement costs.

There is no reversal of this trend in sight. Continuing inflation is now silently condoned by both political parties.

Pressure Is On—Actually, there is considerable pressure on both the Congress and on the White House for a substantial increase in the nation's defense budget. Talk is what the present level of around $41 billion could be ("should be," they say) jumped to $48 or even $50 billion a year.

Many defense contractors, eager to step up their government orders, are quietly urging a jump of these proportions. And they are encouraged in their pitch by the military leaders.

Plant Dispersal Probe

A detailed study of the advantages of plant dispersal to protect defense industries from enemy attack is being demanded by a congressional committee.

The Senate-House Committee on Defense Production is again calling on the new Office of Civilian and Defense Mobilization to conduct the study, and report to Congress by next March 31.

Labor Versus Supreme Court

Organized labor is ready to jump into the federal-versus-state control controversy.

Several large AFL-CIO unions —and perhaps the parent AFL-CIO itself—are preparing to ask the new Congress to pass legislation to override two recent U. S. Supreme Court decisions.

Behind the Rhubarb—One case involves whether state courts have the power to award damages to individuals who are prevented by a picket line or threats of force from entering their place of employment. The other includes damages for persons wrongfully expelled from union membership.

The high court has ruled such damages within the power of state courts.

The Strategy—Labor, according to reports, will ask Congress to amend the Taft-Hartley Act to put the lawmakers on record as claiming exclusive jurisdiction in these fields. This would prevent civil suits on matters which come before the National Labor Relations Board.

Unions protest that under the Supreme Court rulings, they are vulnerable to damage suits every time they strike. They fear that Southern juries would return anti-union verdicts in large numbers, and bankrupt many locals.

The Other Side — The union position is in sharp contrast with an unsuccessful move by conservatives over the past few years to pass legislation specifically spelling out powers of the states in various matters.

Using a beaker to represent a cutting oil sump, this laboratory demonstration shows how cutting oil is diluted by 3 to 8 gallons of lube oil per shift in most automatic screw machines.

It happens in 7 out of 10 automatics!

Diluted cutting oil can cut output 33%

No matter how careful your lubricating techniques, you still can't stop lube oil from leaking into the cutting oil sump on 70% of automatic screw machines. As cutting oil is diluted, it loses strength—ingredients that make it efficient become less and less effective. The natural consequence is shortened tool life, more downtime and a higher percentage of rejects.

Texaco Cleartex can end this problem forever. All you have to do is use Cleartex for both cutting *and* lubrication . . . and watch your production rise. The exceptional chemical stability and load-carrying ability of the Cleartex series make them equally suitable for use as cutting oils, lubricants and hydraulic fluids. (70% of all automatic screw machines can benefit from the "Cleartex Cure!")

TAKE THE CLEARTEX CURE SOON!

Write today for your copy of Texaco's new booklet—"Cleartex in Automatic Screw Machines." This new illustrated guide will fill you in on the details, show you where you may be losing profits and how to avoid it . . . Or contact your local Texaco Lubrication Engineer soon for an authoritative survey of your automatics. Just call the nearest of more than 2,000 Texaco Distributing Plants, or write to The Texas Company, 135 East 42nd Street, New York 17, New York. Dept. IA-FM-10.

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LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Early Gains Expected in Farwest

Strong First Quarter Predicted by Business Leaders

Economic optimists are the rule, not the exception, in the western U. S.

Majority in business survey believe this quarter will top either first or last quarter of '58.—By R. R. Kay.

▪ Strong first quarter gains are predicted for the West Coast economy. Over 1000 business leaders there expect improvement over both the first and last quarters of 1958.

Here's how they view the area's economic outlook in the latest "Western Business Forecast" conducted by the Prudential Insurance Co. of America:

Equal or Better—Almost 80 pct of the panel say first quarter '59 will top first quarter '58. A husky majority of 89 pct believe January-March business will equal or better the same period last year. And over three-fourths predict business this quarter will equal or top the final quarter of '58.

Gains of from 1 to 10 pct over last quarter '58 are counted on by 42 pct of those surveyed. Another 22 pct look forward to even greater gains.

All-Industry View—There's nothing spotty about the outlook. Thumbs-up votes come from almost all major industries and services. But the transportation, public utilities, and trade groups expect to do best: 93 pct of their leaders say "equal or up."

Confidence runs high throughout the West. The Idaho-Montana-Utah region looks for a better first 1959 quarter. That's the opinion of 87 pct of their panel members.

In the large southern California-Arizona-Nevada market, 89 pct say up.

But northern California and Hawaiian business leaders are the most optimistic. Of them, 92 pct look for an improved sales curve.

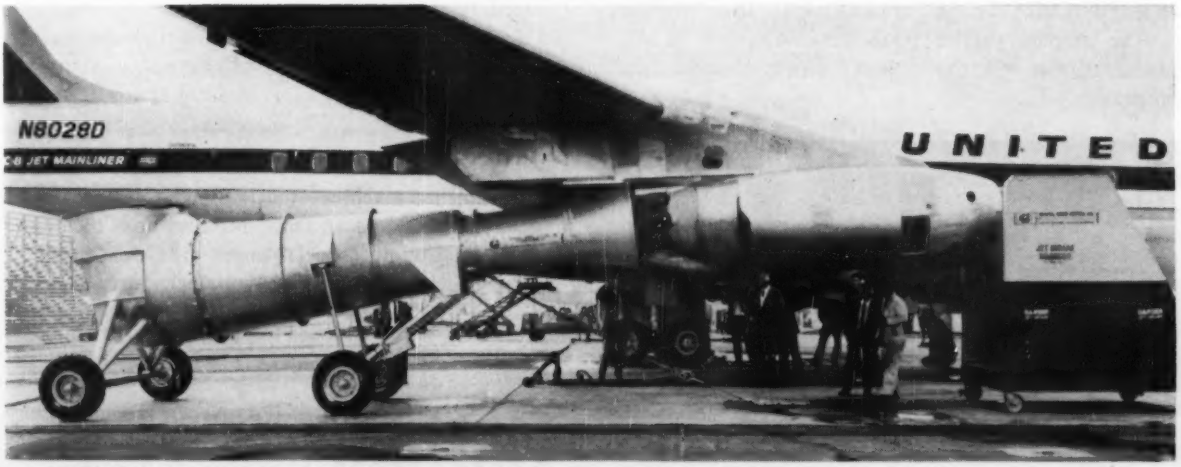
Power Equipment Fight

A dispute over British-made power equipment has affected work on the State of Washington's new Columbia River dams.

U. S. manufacturers want the Office of Defense and Mobilization to bar future imports of generators and transformers from Great Britain. They claim security reasons. They say that replacements might be impossible to get under war conditions.

Seattle City Light Corp. reports the transformers are "satisfactory and represent substantial savings."

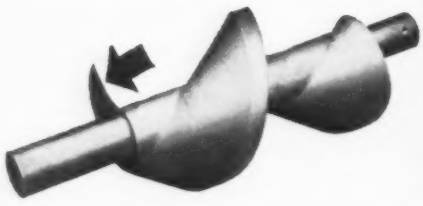
Solving Problem of Jetliner Noise

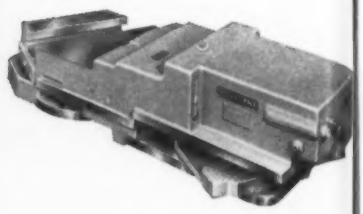


PORTABLE MODEL: This engine noise suppressor, developed by General Sound Control, Inc. for jetliner use, has adjustable undercarriage for easy transport to airport areas. It's demonstrated on Douglas DC-8.

New turning idea is born...

LeBlond Engineers turn trick with tracer

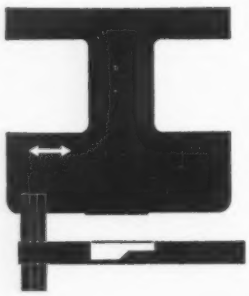


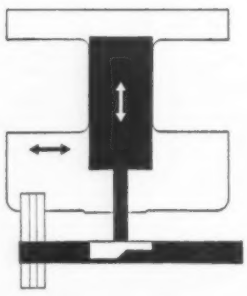


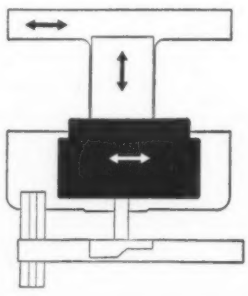
1. Problem workpiece—spiral rotor for pumps manufactured by Roots-Connersville Blower Co., Connersville, Indiana. Shaping just couldn't produce the wide variety of exact contours their engineers wanted. Could rotors be *turned*—automatically?

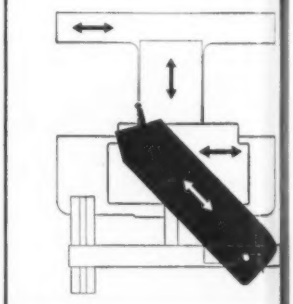
2. Why not? With special end gearing and full nut, we can "chase" the spiral shape like a coarse thread. That's easy . . . the problem is the contour.

3. We'll use Hydra-Trace to *position* the tool (not to trace). We can mount a special length slide on the cross slide to give us feed *between* cuts.







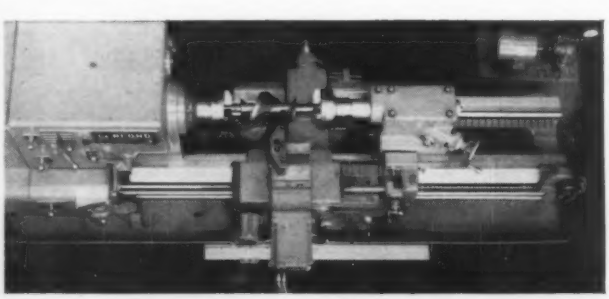


4. Let's see how this looks in plan. The carriage provides length motion for the tool. The template carrier moves lengthwise with the carriage.

5. The cross slide gives cross travel plus automatic tool relief. The template carrier also moves "in and out" with the cross slide.

6. The special length slide gives us feed. Not continuous feed. Just tool-positioning feed that moves the stylus along the template for each successive cut.

7. The template controlled Hydra-Trace positions the tool to produce the contour. During the cut, no feed takes place. Only the chasing action.



8. Here's the finished machine—the LeBlond Contour Chasing Lathe, basically a 32″ Standard Duty. Modifications include: special end gearing, full nut, special length slide, automatic cycling and special heavy duty reversing electrics. Lathe chases leads from 4½″ to 16″.

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World's Largest Builder of A Complete Line of Lathes for More Than 71 Years

Latest Move to Tape Controls

G&L Vertical Turret Lathe Cuts Short-Run Costs

Giddings and Lewis say tape also promotes faster operations at higher speeds.

New override adjustment control permits operator to add information to the data system. —By E. J. Egan, Jr.

▪ Add another machine tool to the list already taking orders from reels of tape. The latest: A vertical turret lathe, just announced by Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

The company is booming its virtues as a real cost-cutter for the whole range of short-run jobs VTL's are built to handle. Users will get quicker setups, faster operations between cuts, higher cutting speeds, and consistently better quality in finished workpieces, G & L officials maintain.

Controls — An eight - channel punched tape system controls a wide range of machine functions. Primary ones are feeds, speeds, turret indexing, automatic dwell, and coolant supply.

All auxiliary functions the machine is able to perform are tape controlled also; such details as constant cutting speed, thread cutting, drum scoring, cutting of tapers, and step turning.

Still another feature of the new lathe well worth noting: G & L dubs it an "override adjustment control," says it makes the machine even more practical for general shop use.

Changes Can Be Made—With this control, the machining data originally programmed needn't be the last word. In making his setup, or in running a job, the operator can make fine adjustments for height and radius, let's say, and add this information to the data system. Automatically these adjustments become part of the taped program.

One use for this adjustment feature is to compensate for tool wear. Cutting tools can be control-positioned over a range of ±0.010 in., making it easier to hold critical workpiece dimensions. Changing preset tools takes very little time after they reach their wear limits. When new tools go on the lathe, the operator returns the adjustment control to its original setting.

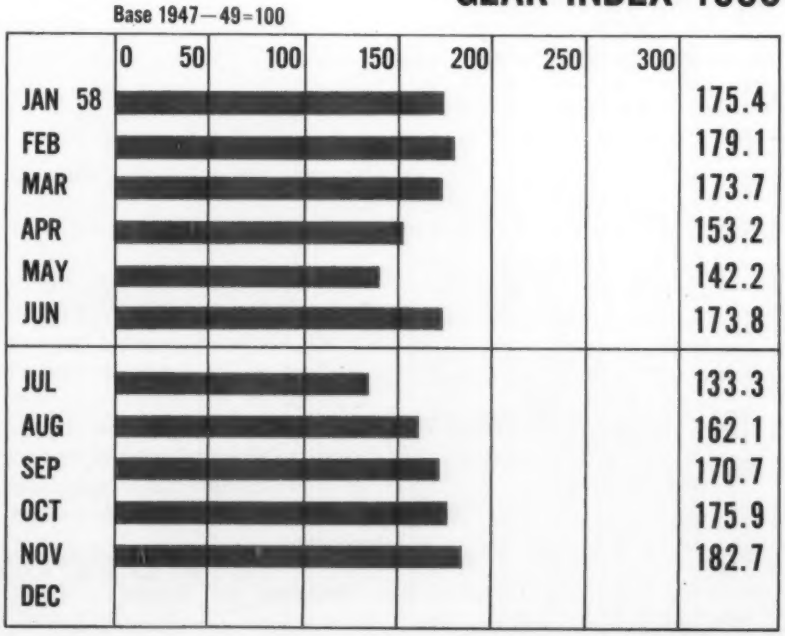
The adjustment features help a lot in switching tape programs around in a battery of these machines. Original engineering and program data can be stored as a perfect master, regardless of the particular adjustments certain machines might need.

New Standard

A new American Standard (B5.23-1958) covers the key dimensions of inserted blade milling cutters and bodies. It's aimed at reducing the large number of cutters many plants must stock to do virtually the same jobs, but on different milling machines.

Copies of the Standard cost $1.50 each. They're available from American Standards Assn., 70 E. 45th St., New York 17, or from The American Society of Mechanical Engineers, 29 W. 39th St., New York 18.

GEAR INDEX 1958



Source: American Gear Manufacturers Assn.

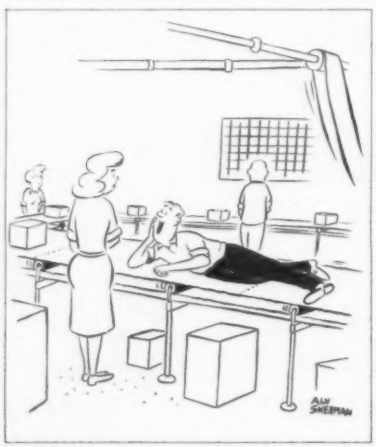
INDUSTRIAL BRIEFS

New Bearings Plant—Split Ballbearing, Div. of Miniature Precision Bearings, Inc., has opened a $600,000 plant at Lebanon, N. H. The new plant will enable Split Ballbearing to manufacture bearings for new applications in aviation, farm machinery, precision instruments, and other fields. It will also allow Split Ballbearing to triple its capacity.

Production Transfer—The Landis Tool Co., Waynesboro, Pa., has acquired the full line of precision surface grinders previously manufactured by the Abrasive Machine Tool Co. of East Providence, R. I. Manufacturing and sales will be transferred to the Waynesboro plant.

Potent Cutter—S. Blumberg & Sons, Inc., Philadelphia, is installing a new 800-ton hydraulic shear as part of a long term expansion program. The huge shear, which will cut through 2-in. plate, costs $200,000, is one of the largest in the East.

New Letterhead—Union Carbide Corp., has a new name for its metals division. Electro Metallurgical Co. becomes Union Carbide Metals Co. and will continue to sell and produce products under the long-used "Electromet" trade-mark.



"I'm new here . . . will this take me to the shipping department?"

Move to Monroeville—Koppers Co., Inc., Pittsburgh, will start construction this year of a new research center at Monroeville, Pa. Cost of the new center is expected to reach about $10 million. As new Monroeville facilities are completed, certain laboratory activities now based at the Verona, Pa., research center will be moved to the new site.

New Division for S-B — Salem-Brosius, Inc., Pittsburgh, has agreed to buy the plant and assets of R. H. Freitag Mfg. Co., Akron, O. Freitag will be operated as a division of Alloy Mfg. Corp., a Salem-Brosius subsidiary, which makes reactor components. The acquired company is a supplier of equipment and parts to the atomic energy, automotive, aircraft, electronics, marine and rubber industries.

Solid Purchase — Inland Steel Products Co., Milwaukee, a subsidiary of Inland Steel Co., has purchased the tools and machinery used for production of rigid frame metal buildings at Steelcraft Mfg. Co., Cincinnati. Purchase is part of a multi-million dollar expansion of Inland Steel Products' metal building line.

Machine Tool Forecast — The government is offering free copies of its official 1959 outlook for the machine tool industry. It's a factual and detailed account of about 2500 words. For copies, write Director, Metalworking Equipment Div., Business and Defense Services Administration, U. S. Dept. of Commerce, Washington 25, D. C.

Refractory Research—Harbison-Walker Refractories Co. has opened its new Garber Research Center in Pittsburgh. The center is named in honor of the company's president, Earl A. Garber. The facility houses a full complement of laboratories for instrumental research and a complete pilot plant for applied research.

Stainless for Service — T. T. Snyder, service representative in the Washington Commercial Office, U. S. Steel Corp., has received the corporation's 40-year pin and stainless steel service watch. Mr. Snyder was born and educated in Washington and has spent his entire 40 years with U. S. Steel there.

Sole Chief — Olin Mathieson Chemical Corp., has sold its majority interest in Hunter Engineering Co., Riverside, Calif., to J. L. Hunter, who now becomes sole owner of the company. The firm will continue to manufacture aluminum sheet, strip and extrusions. The two companies will cooperate on various aluminum research projects.

From Shop to Lab—Continental Can Co., has presented a $500,000 equipment manufacturing plant in Syracuse, N. Y., to Syracuse University, which will use it to house research activities. The company will continue to operate a can plant and a corrugated box plant in Syracuse.

Towers for Power — Blaw-Knox Co., Pittsburgh, will build ten more transmission towers and a new substation for the Campbell Works of Youngstown Sheet & Tube Co., Youngstown, O. The towers will be used for in-plant distribution of power from the lines of the Ohio Edison Co.

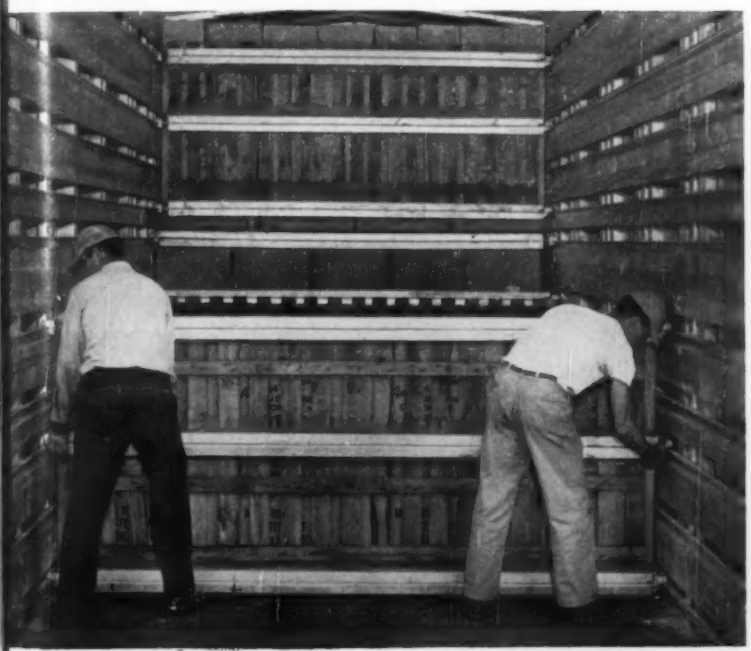
Gold for Merit—Martin Ronning, chief research engineer, Minneapolis-Moline Co.; Ben Van Zee, retired, Minneapolis - Moline Co.; Wayne Worthington, director of research, John Deere Research & Engineering Center; and Maynard Coe, director, Farm Div., National Safety Council, have received the 1958 Farm Equipment Institute Gold Awards.

Power for Copper — Westinghouse Electric Corp. will provide a power supply using silicon rectifiers for electrolytic refining of copper. An order for the equipment, which will be installed at the Baltimore, Md., plant of the Kennecott Copper Co., has been received from M. W. Kellogg and Co.

These workmen are using Youngstown Yoloy "E" high-strength steel to fabricate belt rails—a component of DF Loaders—at Evans Products Co.

Accent on Excellence

Youngstown Yoloy "E" high-strength steel



EVANS DF LOADER . . . *Locks in lading, eliminates damage and dunnage*

Two DF* Loader-equipped railroad cars easily do the work of three standard box cars. That's because DF cars (31,000 now in service) can be loaded to capacity—earn greater revenue for railroads.

Portions of Evans DF Loaders are fabricated from Youngstown's Yoloy "E" Angles and Hot-Rolled Yoloy Sheets by Evans Products Company, Plymouth, Michigan. All Yoloy Steels are produced to meet a wide range of applications, where high strength and corrosion-resistance are of prime importance.

Wherever high strength steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

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LIMA... Virtually at the center of the steel industry

J. H. Strassburger, named vice president, research and development, National Steel Corp., Pittsburgh.

J. H. Rowland, elected president, Phoenix Bridge Co., subsidiary of Barium Steel Corp., Phoenixville, Pa.

C. D. Grover, elected chief officer, Whitehead Metals, Inc.; **T. M. Bohen,** elected honorary chairman of the board.

E. F. Twyman, elected senior vice president, The Yale & Towne Mfg. Co., New York.

R. L. Becker, elected president, Wear-Ever International, Inc., a wholly-owned subsidiary of Aluminum Co. of America, Pittsburgh.

J. F. Johnson, appointed asst. vice president, export, National Steel Corp., Pittsburgh.

R. E. Lenhard, appointed president, Industrial Gases and Welding Products Div., Air Reduction Sales Co.

R. F. Schutz, appointed executive vice president and manager, Ingersoll - Kalamazoo Div., Borg-Warner Corp.

F. M. Ryan, becomes vice president and general manager, Norton Behr - Manning Overseas Inc., Worcester, Mass.; **F. B. Scott,** named vice president, sales, Behr-Manning tape and coated abrasive products; **L. J. Camarra,** vice president, sales, Norton abrasive and refractory products.

C. R. Welles, appointed vice president, sales, Hanna Furnace Corp., Merchant Pig Iron Div. of National Steel Corp.

G. R. Metzdorf, appointed manufacturing vice president, Capitol Products Corp., Mechanicsburg, Pa.

R. P. Bremner, elected vice president, raw materials, The Youngstown Sheet & Tube Co., Youngstown, O.; **D. S. Day,** vice president, traffic; **Dr. K. L. Fetters,** vice president, research and development; **J. D. Sloan,** vice president, purchasing.

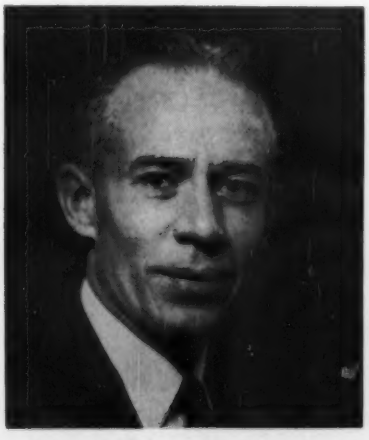
W. H. Preston, elected executive vice president, Chase Brass & Copper Co., a subsidiary of Kennecott Copper Corp., Waterbury, Conn.

J. G. Morrison, appointed sales manager, central area, National Tube Div., U. S. Steel Corp., Chicago; **L. W. Mason,** named sales manager, eastern area, National Tube Div., New York.

F. P. Dashner, elected treasurer, The Fellows Gear Shaper Co., Springfield, Vt.

Following appointments have been made at the Massillon, O., steel plant of Republic Steel Corp.'s Central Alloy District. **C. A. Wiskofske,** named superintendent,

D. L. Price, elected vice president, Norton Co., Worcester, Mass.



W. E. Quigley, elected comptroller, The Anaconda Co., New York.

Harvey Craig, named manager, trade relations, Republic Steel Corp.

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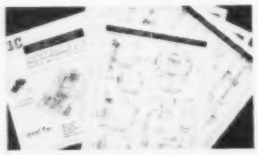

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Openhearth Dept.; **R. A. Bechtold,** named asst. superintendent, Openhearth Dept.; **J. T. Foster,** appointed asst. superintendent, blooming and bar mills.

W. R. Ogg, becomes manager, distributor sales, Grinding Machine Div., Norton Co., Worcester, Mass.: **C. K. Kirk,** named Chicago district manager; **T. D. Bushman,** named product research engineer.

W. F. Wheeler, Jr., elected executive vice president and director, American Chain & Cable Co., Inc.

A. T. Enk, named manager, Design Dept., Surface Combustion Corp., Toledo, O.

William Eismann, Jr., appointed manager, national lubrication sales, E. F. Houghton & Co., Philadelphia; **C. R. Schmitt,** named assistant to the vice president, sales.

Dr. I. E. Campbell, named director, Research and Development Dept., National Steel Corp.

F. A. McClelland, appointed general manager, sales, Sales Div. Wheeling Steel Corp., Wheeling, W. Va.

J. V. Sutton, appointed manager, Contract Div., Textile Machine Works, Reading, Pa.

G. P. Michalos, named superintendent, inspection, Steel and Tube Div., The Timken Roller Bearing Co., Canton, O.

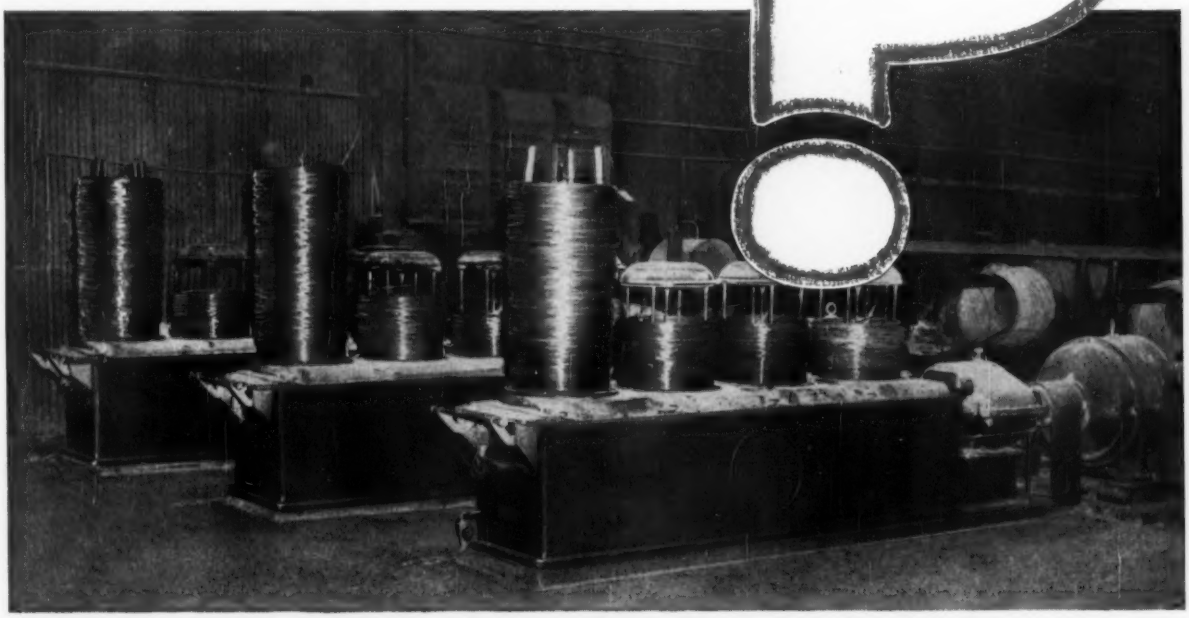
George Ramsden, appointed asst. general manager, North Central Div., Link-Belt Co.'s Minneapolis plant headquarters.

G. E. Gann, appointed director, purchases, McLouth Steel Corp., Detroit.

J. A. Holloway, named manager, tin plate sales, Wheeling Steel Corp., Wheeling, W. Va.

F. S. Eckhardt, appointed assistant to vice president of the Steel Div., Bethlehem Steel Co., Bethlehem, Pa.; **R. H. Meyer,**

want **BIG** *bundle capacity*?



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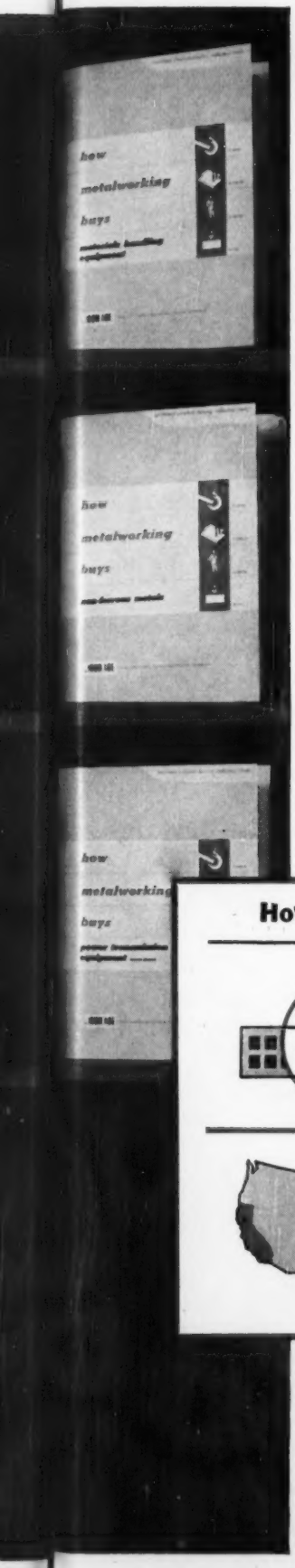
how metalworking buys
how metalworking buys
How Purchase-Decision Executives take part in purchases of Machine Tools & Other Metalworking Equipment
How Purchase-Decision Executives take part in purchases of Metal Cleaning & Finishing Equipment

NEW IRON AGE PURCHASE-DECISION STUDIES identify buying-specifying team for seven major types of metalworking equipment, four types of components, three materials, and engineered products and services. Data is based on probability sampling, analyzes purchase-decision roles of metalworking executives by title, primary function, and multiple function—by industry and by plant size.



How to Increase Your Sales Efficiency in Metalworking

New IRON AGE purchase-decision research tells you how metalworking buys . . . identifies buying-specifying team . . . shows influence of each executive function

If you know the industries that comprise your metalworking markets, as well as their relative importance and location,* you are well on your way to getting more for your marketing dollar in metalworking. To complete the picture, however, you need to know how each industry buys and also which executives are influential in purchase decisions.

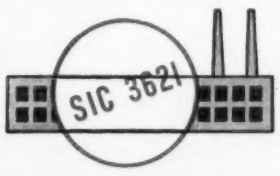
This information is now available to you in the IRON AGE's new ARF-appraised National Analysts Studies of Buying Influences in Metalworking. This authoritative data — compiled by one of the country's leading research organizations—identifies, by industry and plant size, the buying-specifying team for each of 15 major product categories sold to metalworking. Also it analyzes the relative influence of various executive functions on purchasing decisions. Thus it pinpoints the executives you must presell for successful marketing—many of whom cannot ordinarily be reached by your salesmen.

Based on probability-sampling techniques and interviews in depth with 2211 executives in 596 plants, this new IRON AGE research data provides definitive purchase-decision patterns for the metalworking plants doing 94% of the buying—those employing 20 or more plant workers. Data is presented in detail to show the extent to which executives participate in purchase decisions, the level of their purchasing responsibility,* and specific roles played in purchases. It is analyzed in terms of title, primary function and multiple function, as well as by 2-digit industry groups and plant size.

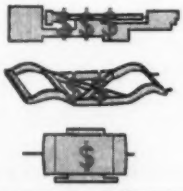
These buying-influence studies are just one of the tools available to you under the IRON AGE's new Marketing Assistance Program designed to help you carry out the four steps below in meeting today's profit squeeze and preparing for tomorrow's new wave of expansion For complete details, contact your IRON AGE representative.

*For help in classifying prospects and customers by new 1957 SIC codes, evaluating your metalworking market potentials, and pinpointing major sales targets, ask about IA's new Master List of Plants in Metalworking and Basic Marketing Data.

How to Get More for Your Marketing Dollar in Metalworking

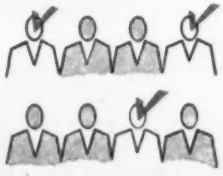


1. Identify the industries that make up your markets



2. Evaluate market potential of each industry

3. Gear sales efforts to market potential



4. Increase sales efficiency by preselling buying-specifying team

The **IRON AGE**

A Chilton Publication

Chestnut & 56th Sts., Philadelphia 39, Pa.

named asst. general manager, Lackawanna, N. Y., plant; **J. C. McCord,** named coke ovens superintendent at Lackawanna.

H. S. Kaltenborn, named vice president and assistant to president, and **Dr. S. W. Herwald,** elected vice president, research, Westinghouse Electric Corp.

R. L. Schroeder, promoted to general sales manager, Pesco Products Div., Bedford (Cleveland), Ohio, Borg-Warner Corp.

Don Rumsey, named manager, Kansas City district office, Ross Heat Exchanger Div., American-Standard.

Alfred Provencher, appointed Chicago district manager, Arcos Corp., Philadelphia; **Carl Gage,** named New England district manager.

G. H. Crocker, appointed general sales manager, Roots-Connersville Blower Div. of Dresser Industries, Inc., Connersville, Ind.

L. F. Harding, named Chicago district director of sales, The C. O. Bartlett & Snow Co.

E. J. Griesbaum, appointed sales manager, tubular products, Laclede Steel Co., St. Louis.

Dr. D. G. Wilson, appointed general manager, Stromberg-Carlson, San Diego.

E. N. Fleming, named superintendent, maintenance, Green River Steel Corp., Ownesboro, Ky.

OBITUARIES

C. S. Redding, 75, chairman of the board and former president, Leeds & Northrup Co., Philadelphia.

R. A. Langer, president and advertising director, American Metal Market, New York.

R. O. Peterson, 59, vice president, Brush Div. — Engineering, Osborn Mfg. Co., Cleveland.

R. C. McQuire, 63, manager, Nickel Refining Div., The International Nickel Co. of Canada, Ltd., Port Colborne, Ont.

Carl Zak, 50, general sales manager, Phoenix Steel Tube Div., Phoenix Iron & Steel Co.

V. E. Minich, 91, founder and honorary chairman, Wheelabrator Corp., Mishawaka, Ind.

E. E. Roberts, 53, asst. purchasing agent, The C. O. Bartlett & Snow Co., Cleveland.

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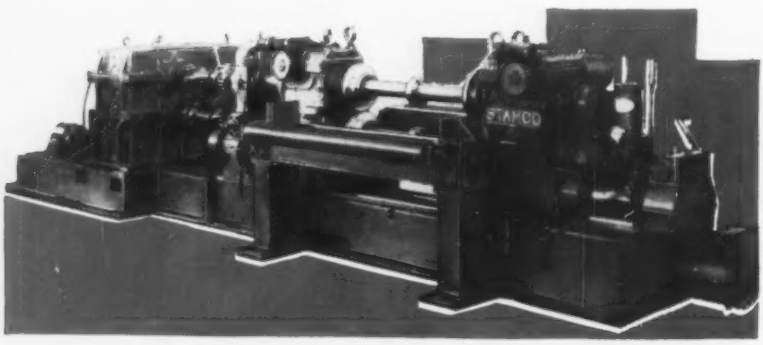

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GEORGE S. CASE, Jr., *President,*

Lamson & Sessions, tells...

How we've planned our organization to help you "tighten up" on fastening costs

TOO OFTEN, unit price has been the sole criterion in fastener buying. Actually, what you want to buy and what we have to sell is *lower total cost* of assembly.

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Two new, ultra-modern plants at Cleveland and Chicago—plus up-to-date plants at Birmingham, Kent and Cuyahoga Falls, Ohio—representing an investment of more than $18,000,000 in fully-integrated, high volume, high precision production facilities.

A new concept of customer service through effective co-ordination of all departments—Sales and Order Service, Research and Development, Engineering, Quality Control, Purchasing, Inventory Control, Packaging and Shipping.

Today, as industry moves more and more toward automated or semi-automated production and assembly, highest quality and reliability of components becomes a *must.* Our entire effort is organized to assist you in attaining this goal—where *any* type of standard or special fastener is required.

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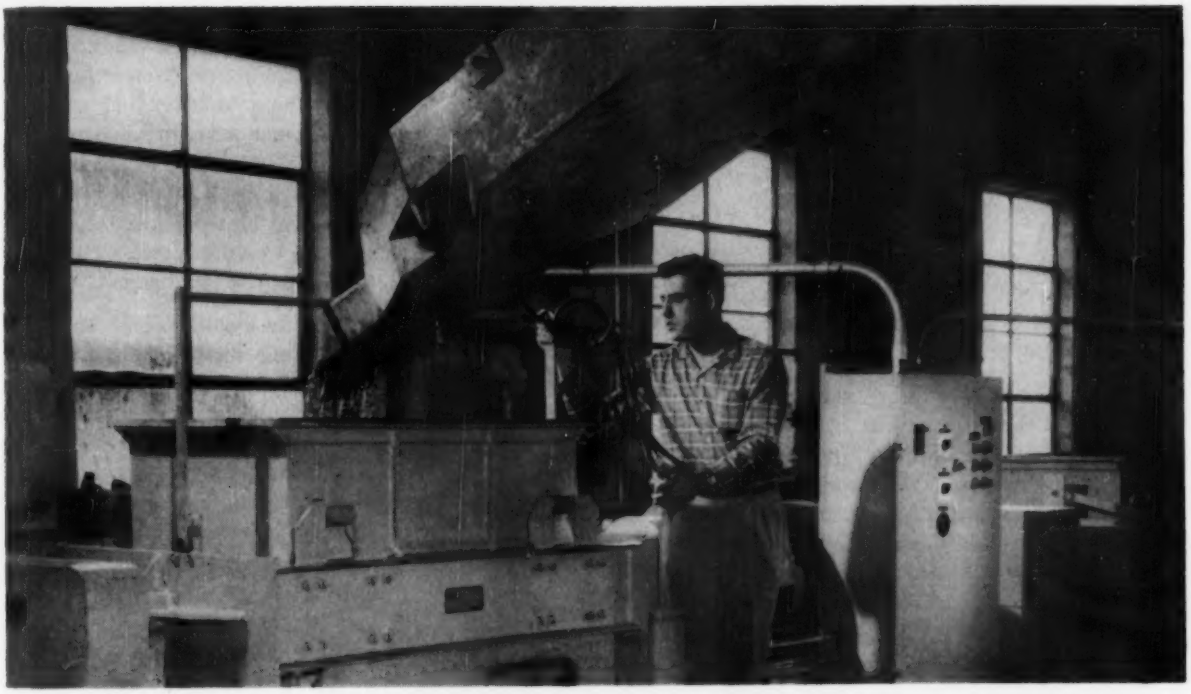


LOADING UP: Operator charges media into spring-mounted "bowl" of 30-hp, 17.5-cu ft Lorco Vibrator.

Controlled Vibrations Speed and Simplify Parts Finishing

By **W. E. Brandt**—Vice President, Lord Chemical Corp., York, Pa.

If you tumble-finish metal parts, here's a new process you should know about.

It uses controlled vibratory action to finish interior and exterior surfaces in record time.

▪ A new method for precision finishing metal parts works from 10 to 200 times faster than barrel tumbling. Moreover, it works as effectively on shielded or interior surfaces as it does on external sections.

The process is based on the controlled, three-way vibration of a simple container loaded with workpieces and finishing media. The new method, and the machine which applies it, were developed by Lord Chemical Co., York, Pa., longtime specialists in precision barrel finishing.

No Revolving Drum — Unlike conventional tumbling machines, the Lorco Vibrator has no rotating drum or compartments. Workpieces and finishing media are loaded into a spring-mounted open container, or "bowl." A motor-driven eccentric shaft transmits three-way vibratory motion to the bowl.

The open container is not subject to pressure buildup. Work in process may be observed or inspected at any time.

The bowl may also be loaded to within 1½ or 2 in. of its top edge. Even so, it keeps every cubic inch of its load in continuous motion. This contrasts markedly with barrel finishing equipment wherein most of the work is done on the fractional part of the total load which happens to be "sliding" at any given moment.

"Scrubs" Work—Variable vibratory action of the Lorco bowl pro-

duces the desired degree of finish very quickly. It causes rotary motion of the entire load, plus an even more important "scrubbing" action through the relative motion of individual load constituents. This latter action is the chief factor in the speed and efficiency of the process. It's also responsible for the work done on shielded areas and internal surfaces.

Despite its speed and efficiency, the process handles delicate workpieces very gently. Parts which formerly had to be tumbled in small lots to avoid distortion, are run through the vibrator in capacity loads without difficulty.

For example, Fig. 1 shows a group of textile machine parts: a guide measuring 0.009 x 0.350 x 5 in., and eight needles. All edges on the guide require an ample radius. Free tumbling of such parts in any quantity would distort them quickly. The vibrator, however, processes production loads of these guides in 15 minutes without distortion. Needles clean up in a 3-minute cycle without damage to their points.

No Gravity Pressure—The reason for this distortion-free processing appears to be the absence of gravity in the load. The vibrator keeps its load in suspension, thus avoiding the risk of distortion either by load pressure or the effects of a tumbling slide.

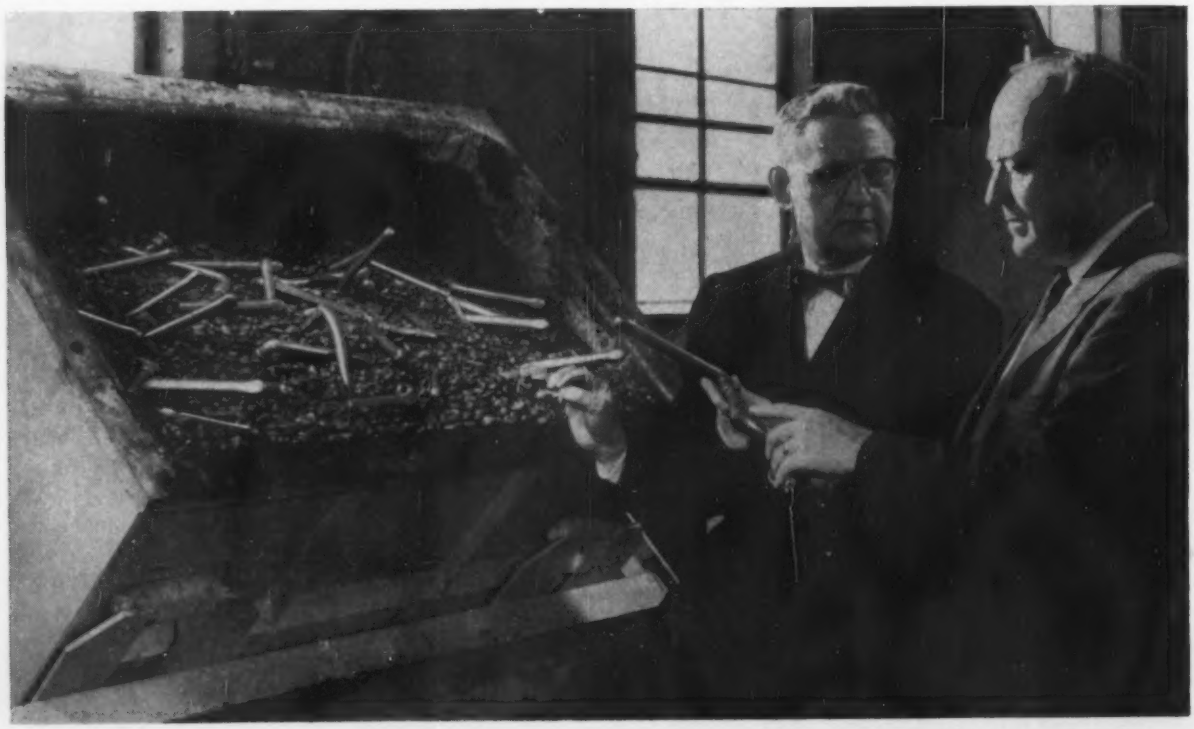
First conceived almost four years ago, the vibratory process staked out a bold objective: to surpass any known barrel finishing technique for cleaning, descaling, deburring, radiusing, grinding, fine finishing, coloring or burnishing any metal or alloy parts.

Successful From Start—The first experimental container had a capacity of less than ½ cu ft, yet it produced astonishing results indicative of what could be done with larger productive machines. In one of its first tests, vibratory motion removed husky burrs from a load of brass parts in just 15 minutes. Formerly, this job took 4½-hours in a large tumbling barrel, using the best-known methods.

There were other successful tests, too. Heavy diecast flash, which needed an overnight run for barrel finishing, took only 23 minutes in the small vibrator. And a 2½-day barrel finishing technique, developed especially for wedding bands and highly filigreed diamond settings, was duplicated by the vibrator in just 1½ hours.

Gets Inside—A significant feature of the test program was the apparently perfect job the vibrator did on shielded and interior surfaces. This has since been borne out in numerous production jobs in industry, using the larger-capacity machines now being produced and sold.

In many cases, the vibratory process eliminates one or more extra finishing operations which formerly were part of conventional cycles. Vibratory removal of interior burrs on the fitting in Fig. 2 illustrates this point.



DOUBLE DUTY: Vibrators save time and floor space in finishing forged bicycle cranks. One unit does a quick cut-down as a first operation. A second unit then adds the fine finish needed for electroplating.

For another example, the large aluminum diecasting shown in Fig. 3 is a part for a dust collector system. As such, it must be smooth inside. Before using a Lorco vibrator, the maker of these parts spent $90 on each one to produce an interior finish that was non-uniform and never quite satisfactory.

He now racks two pieces at a time in a 30-hp, 17½-cu ft vibrator. For less than one-tenth the former cost he gets a satisfactory interior finish plus an eye-appealing exterior surface.

Still Exploring Uses—The full range of use for the new vibratory method is not yet known. However, it is clear that cast, forged, machined and stamped parts are equally suitable for vibratory finishing. Moreover, the equipment will handle the coarsest type of cut-down operation or a delicate fine-finishing job with equal ease.

For example, a bicycle maker uses three large vibrators in a severe cut-down on forged cranks. The same firm uses still another machine to polish the parts. Compared with the former practice, savings in time and floor space are substantial.

Automate Various Ways — Almost all firms using Lorco vibrators have automated the machines somewhat to fit their production setups. Some process castings in 3, 5, and 10-minute cycles without stopping the machine. In other cases, units have run continuously for several months without a shutdown.

In general, vibrators work from 10 to 100 times faster than tumbling barrels. But this ratio can increase to 200:1 in the first 30 minutes of a cycle where cut-down rate is the sole object.

When parts are fixtured, and the fixture is supported on the machine frame or other outside support, time cycles are usually reduced 50 pct. Generally, however, the fixture is supported on the rim of the vibrating container. This again cuts the time cycle in half, since it produces, in effect, two separate vibrations.

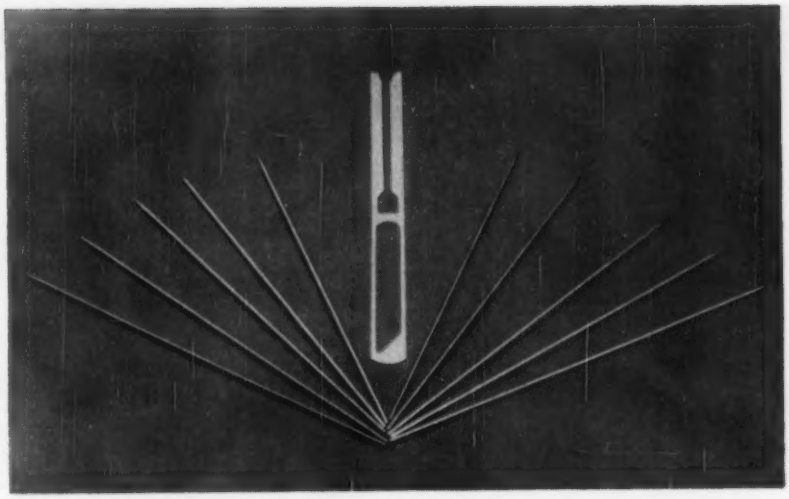


FIG. 1: Vibratory finishing doesn't distort delicate textile machine parts. Loads are in constant suspension, free from gravity pressure.

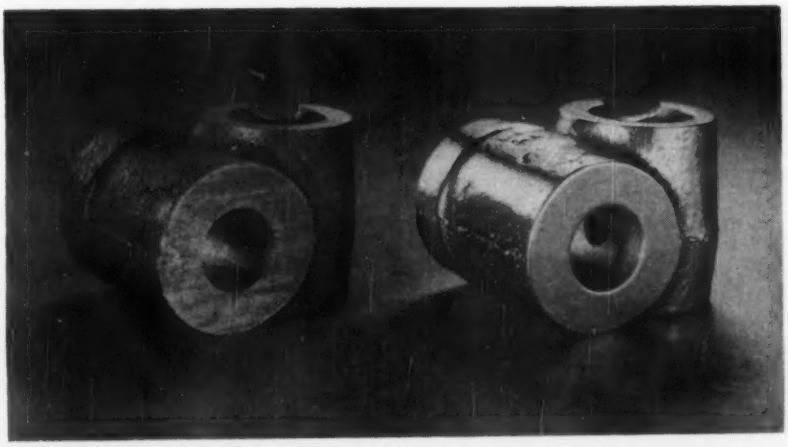


FIG. 2: Removal of burr from inside cast steel fitting demonstrates how well the vibratory finishing process works on shielded areas.

Adjust For Results—This phenomenon works to good advantage in processing very hard metals. In one case the vibrator lowered the microinch reading on forged and machined stainless steel turbine blades by 200 points in a mere 30 minutes. This compares favorably with 0.026 in. of stock removal obtained on bicycle cranks and similar parts in 1½ hours of free processing. When stock removal is not wanted, media, compound and frequencies may be adjusted accordingly.

Vibrators also do the more common finishing jobs faster, better and at less cost. For example, a ton of large steel washers was loaded with just one bag of ground corncob into a 20-hp, 12.7-cu ft vibrator. The machine finished this load in just four minutes.

Vibrator economy stems chiefly from its speed. In this respect, one vibrator can replace 10 tumbling barrels of comparable size. In turn, this brings added savings in floor space and manpower.

Uses Less Media — For all its speed, however, the vibrator actually uses less media and compound than a tumbling barrel. This was

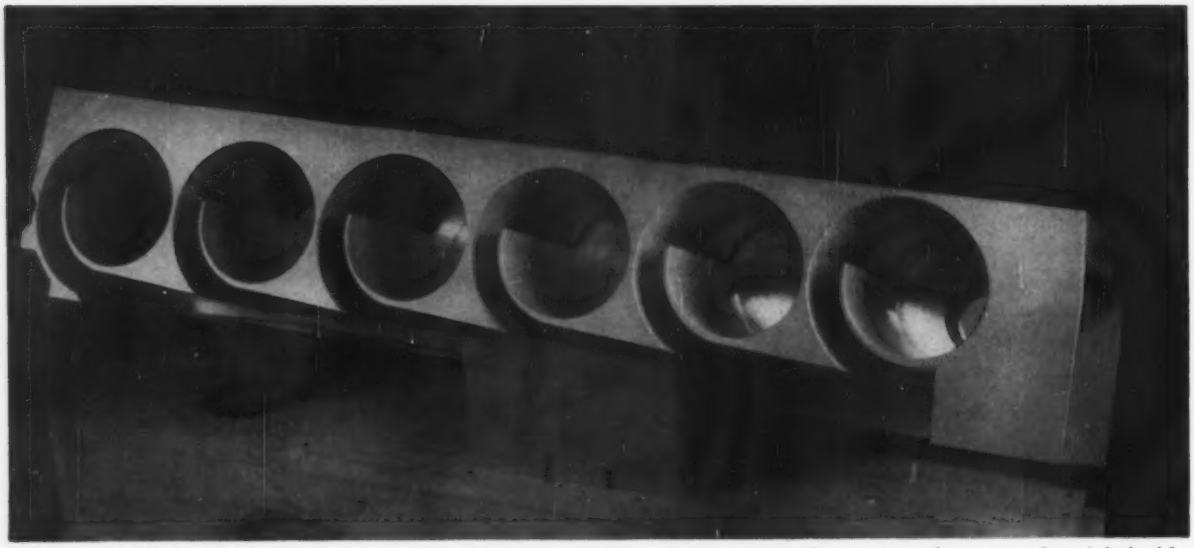


FIG. 3: Shielded and interior surfaces present no problems in vibratory finishing. For less than one-tenth the former cost, the process does a perfect job inside and out on this complex aluminum diecasting.

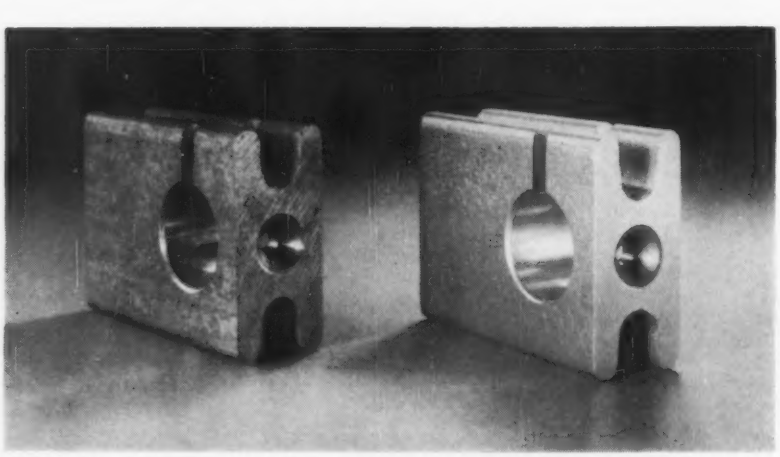


FIG. 4: Fully automated vibrator converts rough-machined steering gear parts (left) into finished pieces at 500-per-hour rate.

shown with a workload of parts that needed a 23-hour tumbling cycle for a severe cut-down. In the vibrator, a much larger load of the same parts used up only one-sixth as much fused aluminum oxide chips. Moreover, compound cost for the vibrator was only one-third as much, since the compound in the tumbling barrel had to be renewed.

Although vibrators can use many types of finishing media, Lord Chemical has developed some which are especially effective and economical. As for compounds, those ordinarily used for barrel finishing are not satisfactory. However, in contrast to barrel processing, the vibratory technique needs only a very few low-cost compounds.

Safe And Simple—Many months of actual production processing show that the automatic, pushbutton vibrator units are sturdy and simple to use. Built-in safety features guard the equipment against accidental damage. Loading and unloading takes only a few seconds.

The following types and sizes of vibrator models are now available:

1. A 2-hp unit of 1.1-cu ft capacity with hydraulic drive and infinitely variable speed.

2. A 10-hp machine of 6.92-cu ft capacity with hydraulic drive and infinitely variable speed in the 300 to 2200-rpm range.

3. A 20-hp machine of 12.7-cu ft capacity in two models: one with constant speed, the other with variable speed up to 1750 rpm.

4. A 30-hp, 17.5-cu ft unit with constant speed, and another model having variable speed up to 1750 rpm.

For Continuous Finishing—Lord Chemical will soon install a large, continuous-process vibrator at its York plant. It's similar to one at the Opel auto works in Germany, wherein steering gear parts, Fig. 4, are conveyed to the unit, finished, and discharged automatically. Media are also automatically discharged, washed, screened and recirculated. Compound is added automatically, also. The machine runs several shifts without attention.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Clay Lengthens Pig Mold Life

A mixture of clay and carbonaceous materials proves an excellent substitute for lime as a pigging machine coating.

It easily parts pigs from molds and cuts down costly maintenance.

▪ Prior to each use, pigging machine molds are coated to ease parting of pigs. This preparation plays a vital part in mold service life.

Until recently Jackson Iron & Steel Co., Jackson, O., had used burned dolemite lime (quick lime) for coating. Because of the corrosive effects of lime, G. A. Beumont, vice president and superintendent of Jisco, set about to find a better coating.

As a result of trying many materials, he developed a new coating with a clay base. Called Carboclay, it's a high refractory fire clay with great porosity.

Improves Appearance — Carbonaceous materials, added to the clay, assist in releasing pigs from the molds. The coating increases mold life and improves the appearance of the pigs.

The clay material eliminates the corrosive effects of lime. At Jisco, lime corroded overhead structures to the point of costly replacement.

Aside from the above advantages, safety is another big benefit. Men working with Carboclay suffer no eye or skin irritation, even when perspiring.

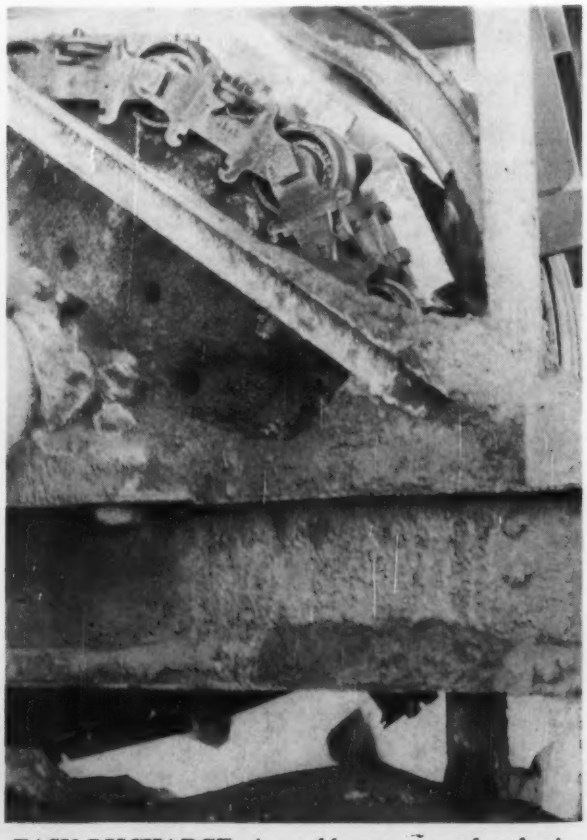
Produced by Cedar Heights Clay Co., Oak Hill, O., the coating is available either in bags or in bulk. After grinding and homogenizing, the mixture is passed through a 50-mesh screen.

Use Same Equipment—The same spray equipment used for lime can apply the clay coating. At Jisco this equipment consists of a vat located below the molds about 25 ft from the discharge end.

After water is added to the dry material, steam agitates the mixture from the bottom. The operator maintains the viscosity as thick as possible, while still able to spray.

Among other users, one large steel mill applies the clay to slag pots where lime was once used. Another mill uses the clay to eliminate costly graphite coatings.

PROTECTION IN SERVICE: Operator takes samples. Clay coating on cast steel molds lengthens their life and reduces sticking of pigs.



EASY DISCHARGE: As molds pass around end, pig knocker taps each mold to release pigs. It's here that additives in clay prevent sticking.

Quick Way to Balance Rotors

By W. G. Kuensch—Consulting Engineer, Cosa Corp., New York

Balancing has grown into an important production process.

Modern electro-dynamic machines quickly spot unbalance, do away with human error.

▪ With today's need for higher speeds, smoother operation and noiseless running, proper balance can no longer be considered a special luxury. In fact, balancing is fast becoming a regular part of many production lines.

Yet, many engineers still fail to recognize its importance. Ample proof of it is the widespread lack of balancing specifications.

Much of this no doubt stems from the fact that balancing is still often thought of as an art, requiring highly skilled operators. Actually, however, modern balancing equipment does away with this former dependence on the human factor.

What They'll Do—Like all machine tools, balancers have been greatly improved over the last 20 years. Today's low-tuned electro-dynamic types immediately convert vibrations of the rotor supports into electric voltage. The entire measuring procedure is done electrically without losses or wear.

Machines of this type, like the Schenck balancers made by Cosa, are immune to extraneous vibrations. Generally speaking, they're also independent of speed. Moreover, modern balancing machines are suited to a wide range of work; the Schenck line covers rotor weights from ¼ oz up to 100 tons.

A rotor supported on springs is subject to a weight influence in one plane when, in the other plane, a weight correction is made. To balance it dynamically without trial and error, this crosswise influence must be eliminated; then the weight corrections applied in the selected compensation planes, as per meter indication, won't influence each other.

Does It Simply — The electric correction-plane setting device in an electro-dynamic machine does this for any compensating plane locations, wherever (between or outside) and no matter how unsymmetrically they are referred to the bearing (pick up) planes.

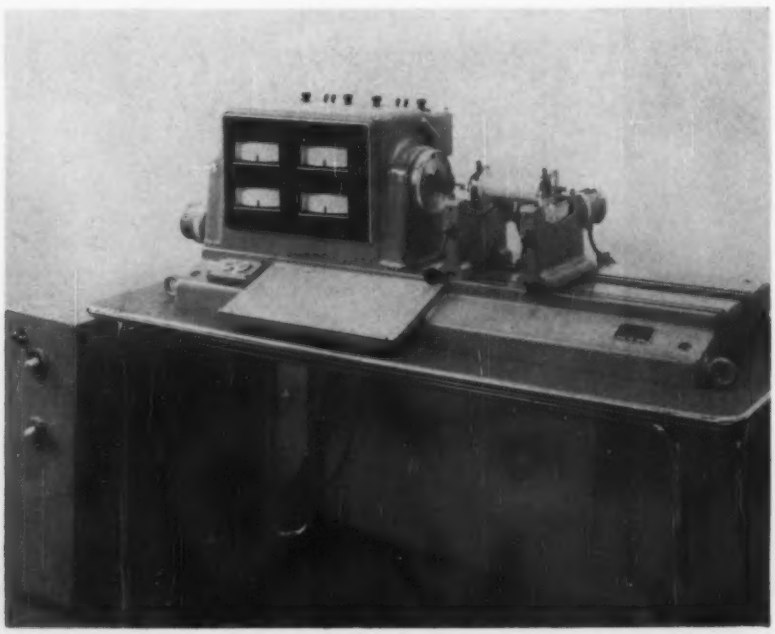
In addition to this, the bearing supports take positive or negative loads. No mechanical problems occur when, instead of balancing between the bearings, cantilever (overhung) balancing has to be done.

The unbalance meter gives out-of-balance in units. To interpret them correctly, the calibration device permits adjusting the unbalance per meter unit to a handy ratio, independently for both planes.

Further Latitude—Besides conventional calibration, it is also possible to have the machine indicate unbalances on both sides, resolved in their plain static or dynamic effect. This might be required for disk-shaped rotors or electro-armatures which are corrected for static unbalance and only checked for dynamic unbalance.

If high initial unbalances of further rotors of the same series exceed the meter range, an extra switch reduces it by 2, 4 and 10, until the rough correction is applied.

Nullifier Is Built-In—A balancing machine usually must be calibrated with a perfectly balanced rotor. Preparing such a master rotor with an uncalibrated machine is a trial-and-error job and takes quite



PINPOINTS TROUBLE: Schenck electro-dynamic machine with unbalance component indicator finds componential unbalance in grinding spindle.

a while, especially for medium and heavier rotors.

A built-in nullifying device permits electrically making any workpiece within one run, and without any weight corrections. The master then can be used for the correction-plane setting and calibration procedure.

A calibrated balancer eliminates trial and error in putting a workpiece into balance. It's a question of seconds or a few minutes to discover where and how much material has to be removed or added.

For Whole Circumference—Vector correction and vector indication of unbalance is desirable for rotors which need correction around the whole circumference. In this case, unbalances should be indicated in their true amount and location.

For this kind of indication Schenck has developed a so-called light spot vectormeter. It has two built-in meters—one for the left and one for the right correction plane. This eliminates changeover switch manipulations.

Any correction around the circumference is resolved into some predetermined direction—into components of a system of coordinates. Any coordinate angle can be established. But for simplicity, the 90° system has been standardized.

How It Works—In the 90° system, a rotor has, in each correction plane, four spots for compensation of any unbalance around the whole circumference. They're lined up with 0°, 90°, 180° and 270° on the protractor dial. By knowing in advance where any weight corrections are finally applied, these spots can be prepared during earlier manufacturing processes.

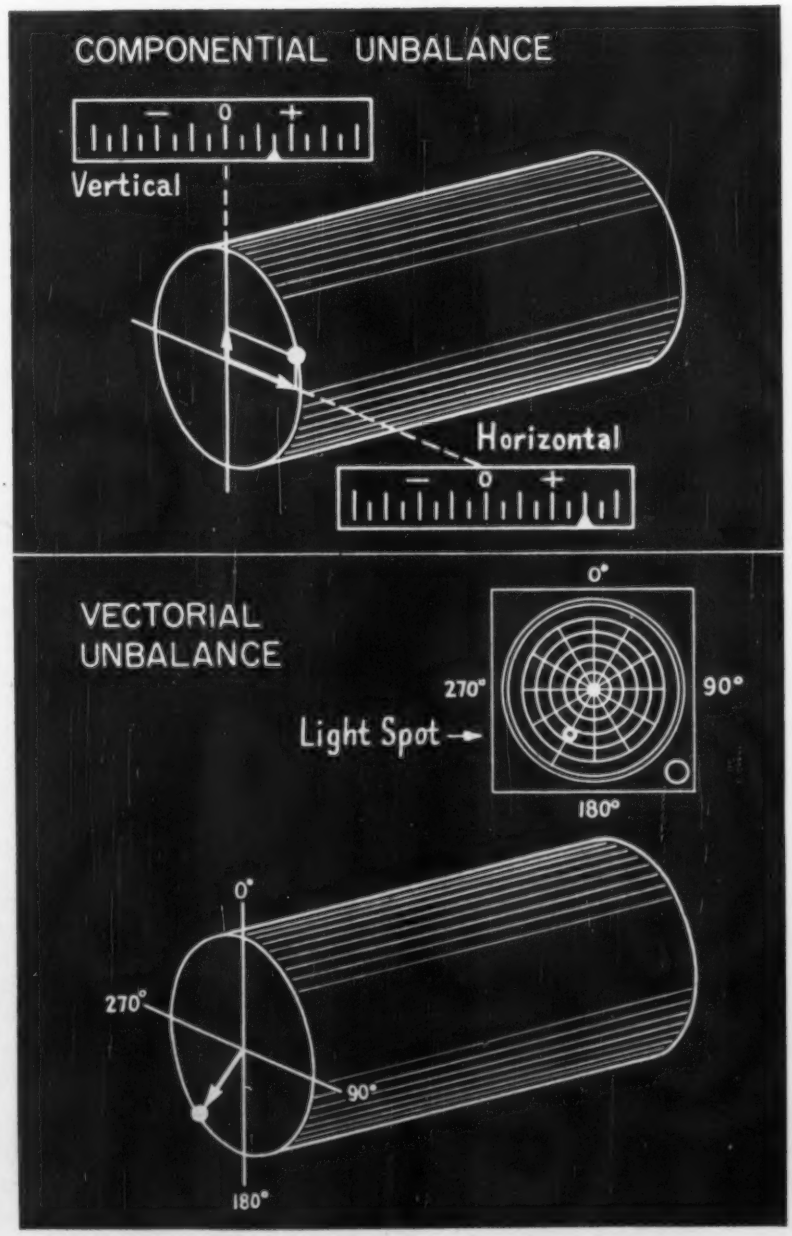
If, for instance, four cast nipples or four tapped holes are provided in each correction plane, weight correction is simply a matter of putting in pre-weighted washers or screws. This costs much less than marking the workpiece and removing metal on a separate machine tool.

As an example, a squirrel cage armature can easily have four nipples for attaching washers or four holes to be filled with lead weights, each 90° apart.

Slotted armatures with a slot number divisable by four don't need any changes. The 90° component indication is positively referred to two slots each, into which wedges of different length are then squeezed.

Additional Screens—Among the variety of balancing jobs, vector- and component-indication is very often required. In this case, use the light spot vectormeter—equipped, however, with various interchangeable screens, instead of just one fixed polar screen.

How Unbalance Is Indicated



What Controls Are Needed For Accelerated Carburizing?

Accelerated carburizing at high temperatures was tried out years ago. Basic experiments uncovered many points of practical importance.

Whether or not present-day heat treaters agree with its conclusions, here is an article they should find provocative—and helpful.

By P. M. Unterweiser,
Metallurgical Editor.

▪ In today's metalworking industry, there is a growing interest in accelerated (high-temperature) carburizing. Especially where heavy carburized cases are required, going to higher temperatures appears to offer attractive savings in time and money.

But along with this new interest, heat treaters must realize that carburizing at temperatures well above 1700° F is not without its problems. A variety of test programs devoted to the improvement of methods and equipment can be anticipated in the next few years. Are there any guiding principles researchers can follow?

New Interest—Accelerated carburizing is not entirely new. Almost 30 years ago, steels were carburized at a number of temperature levels up to and above 2075° F. This early work was done at Warsaw Polytechnical University in Poland.

The man who ran these tests was John Obrebski. He was then an assistant professor at the University. Today he is chief metallurgist of Monarch Machine Tool Co., Sidney, O. The experience he's gained in this field might well prove helpful to others.

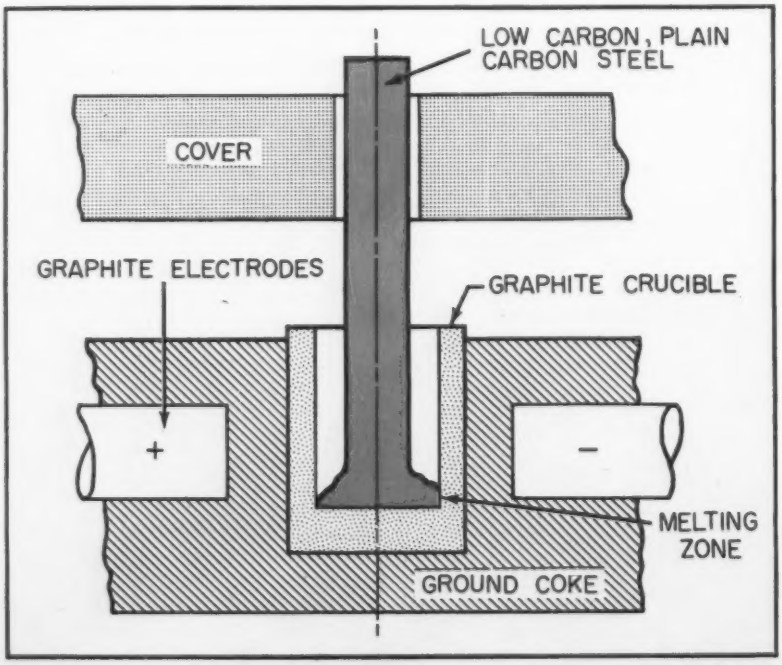


FIG. 1: This laboratory setup permitted carburizing at extremely high temperatures. No limit is placed on the amount of carbon available.

Used Graphite — Initial tests were run with a low-carbon (plain carbon) steel which was carburized in a graphite crucible. The crucible itself acted as the carburizing medium. To see exactly how it was done, study the accompanying sketch of the original setup, Fig. 1.

Notice the two electrodes immersed in ground coke and located on either side of the graphite crucible. When current is applied, heat is generated by the arcing that occurs between these electrodes of opposing potential.

Arcing is continuous. It produces very high temperatures in both the crucible and the steel sample. Because of the temperature level, rate of carburizing is markedly accelerated.

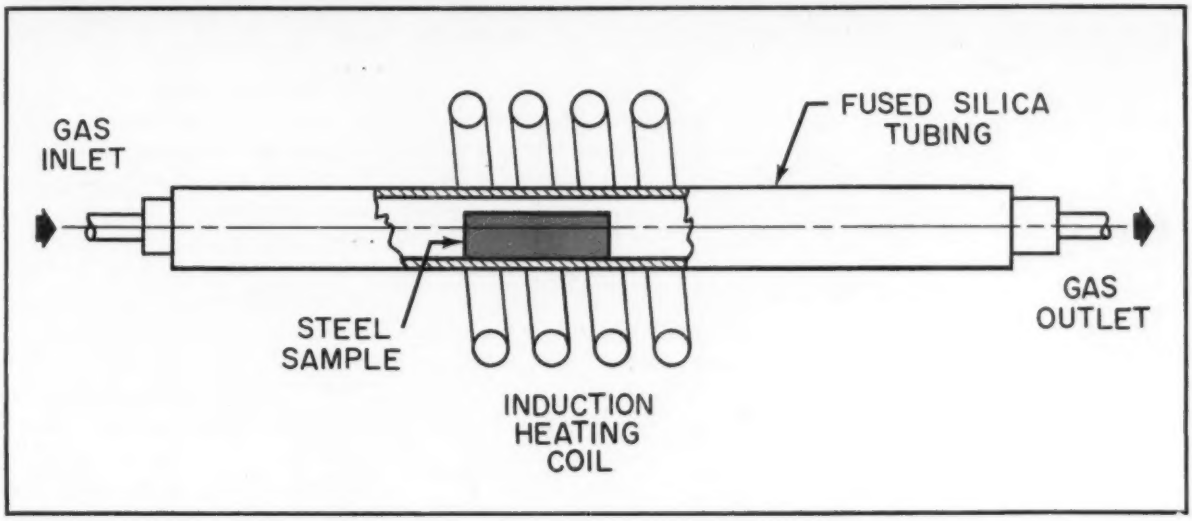
Key Structures — In this test, the lower end of the steel bar actually melted. This was due to the concentration of intense heat plus the fact that carbon content in this portion of the bar exceeded 1.7 pct.

What is the metallurgical significance of these initial tests? Their importance extends from the tangible metal structures obtained to a theoretical connection with the iron-carbon phase diagram.

Let's consider the structures first. These were examined, beginning at the melted end of the bar and continuing upward. Represented are those structures obtainable upon slow cooling from the carburizing temperature when a portion of the steel is permitted to absorb carbon to the point of saturation. Sketched in Fig. 2, a combination of ledeburite and pearlite appear within the zone of melting.

High Carbon—Ledeburite represents the iron-iron carbide eutectic and contains 4.3 pct C. Normally, it is associated with cast iron. Formed from a solid solution, the pearlite contains about 0.80 pct C.

Experimental Setup For Carburizing



It results from slow cooling from a temperature at which austenite containing 0.9 pct C is stable.

Just beyond these structures is another carbon-rich area with considerable carbide precipitation at the grain boundaries and within the pearlite grains. Next, there appears cementite and pearlite followed by a zone of pure pearlite. In the adjacent transition zone, soft ferrite begins to appear along with pearlite. Finally, in the non-carburized core structure, ferrite predominates.

This experiment, including the type of equipment used, was intended to explore conditions that could be obtained at the maximum carburizing temperature (2075° F) with an unlimited carbon potential. Essentially, it reproduces conditions shown in the iron-iron carbide equilibrium diagram.

Control Factors — This experiment in carburizing, according to Obrebski, must not be confused with high-temperature carburizing in an atmosphere with controlled carbon potential. In the case of the graphite crucible, maximum carbon content in the carburized case will depend primarily on carburizing temperature. Carburizing time will play a secondary role.

With controlled atmosphere carburizing, the maximum case carbon content will depend primarily on the carbon potential of the atmosphere. Carburizing temperature will not be the predominant factor in determining case carbon content.

Depth of carburized case will depend on carburizing temperature and time regardless of whether carbon potential is unlimited or controlled at a desired level. If carburizing time is held constant, carburizing temperature will have a predominant influence on case depth. The effect of carbon potential on case depth will be slight.

Brittle Case — Carburizing at the maximum theoretical temperature (2075° F) with unlimited carbon potential will produce case carbon contents approaching the maximum of 1.7 pct.

In combination, higher carburizing temperature and unlimited carbon potential will produce a layer of very high carbon content in the carburized case. If the work is slow-cooled from the carburizing temperature, cementite will precipitate at the grain boundaries. This precipitate will not be dispersed by conventional heat treatment. As a result, the carburized case will be brittle.

Slower Cooling — To achieve satisfactory dispersion of precipitated carbides appears to require drastic quenching from the carburizing temperature in either oil or water. Unfortunately, the resulting thermal shock is likely to result in cracking—either at the surface or internally. For this reason, the precipitated cementite must be dispersed in another way.

Ultra-high carbon content and grain growth combine to increase the hardenability of the carburized case. Consequently, a slower cooling rate should be adequate to both avoid precipitation of cementite and provide sufficient case hardness. Depending on quenching medium and section size, an optimum cooling rate must be selected by test.

Based on experience in quenching from 2020°-2050°F, here are some of the techniques found to be satisfactory. 1) Plain carbon steels may be safely quenched in oil that is warmed to 200°-250°F. 2) Carburizing grades containing Ni, Ni-Cr, or Ni-Cr-Mo, should be quenched in molten salts at 500°-600°F and then cooled in air. 3) Other low alloy steels may be quenched in salt at 400°F.

Avoid Cementite—The immediate purpose of the direct quench from carburizing temperature is to prevent the precipitation of cementite at the grain boundaries. Direct quenching does not rectify grain coarsening, another aspect of high-temperature carburizing that might

adversely affect metal quality. Special grain refining treatments are the answer to this problem, according to Obrebski.

Carburizing grades with a very low (0.10-0.12 pct) carbon content require two grain refining heat treatments, one for the case and another for the core material. Reheating to 1600°-1650°F takes care of the low-carbon core. Treatment at 1400°-1420°F refines the carburized case.

For higher carbon (0.18-0.20 pct) steels and several low-alloy grades, a single grain refining operation is sufficient. This consists of heat treating at an intermediate temperature range of 1450°-1500°F. Some variation from this range may be expected, depending upon specific alloy content.

Two Treatments — In all cases, grain refining is achieved by heating the steel to a temperature above the transformation temperature. Cooling from this temperature has no effect upon grain. The cooling rate chosen should depend entirely upon the mechanical properties desired. Where two distinct refining treatments are involved, the steel may be cooled in air after the preliminary treatment.

Here, for example, is a typical series of treatments that worked successfully with a low-alloy steel containing about 3 pct Ni, 0.70 pct Cr, and 0.30 pct Mo. Parts with a maximum section thickness of ¾ in. were first carburized at 2020°F in an atmosphere with unlimited carbon potential. They were then forced-air quenched. This was followed by reheating to 1580°F and air cooling. A second refining treatment involved heating to 1450°F in a salt bath and water quenching. The parts were finally stress-relieved at 200°-250°F.

Annealing Range — Where machining requirements call for an in-process anneal, this treatment should follow the direct quench from carburizing temperature. Depending on steel composition, a recommended annealing temperature range is 1200°-1250°F. In this range, austenite retained in quenching will decompose. Fine, globular carbides that add to wear resistance are precipitated. This annealing treatment, however, cannot be substituted for grain refining treatments.

Direct quenching from the carburizing temperature must be applied to carburizing that achieves very high (unrestricted) carbon levels. Where a definite maximum carbon potential is maintained, the direct quench may not be required.

For example, where carbon content is controlled to between 0.9-1.0 pct by means of controlled atmosphere, parts may be slow cooled from the carburizing temperature. Grain refining treatments are still recommended for optimum mechanical properties.

Resist Coarsening — Obrebski and other experimenters in high-temperature carburizing have confirmed the fact that plain carbon steels (AISI 1010, 1015, 1020) and free-cutting steels (AISI 1115, 1117) are prone to grain growth. Despite similarity in chemical composition, some heats of these steels will coarsen more seriously than others. For all these grades, a grain refining treatment is required after carburizing.

A number of low-alloy steels will resist grain coarsening, especially at conventional carburizing temperatures. But with temperature ranges as high as 2000°-2050°F, the possibility of grain coarsening must be carefully watched. Where coarsening occurs, refining treatments are obviously beneficial. Such treatments can be easily justified in terms of overall costs.

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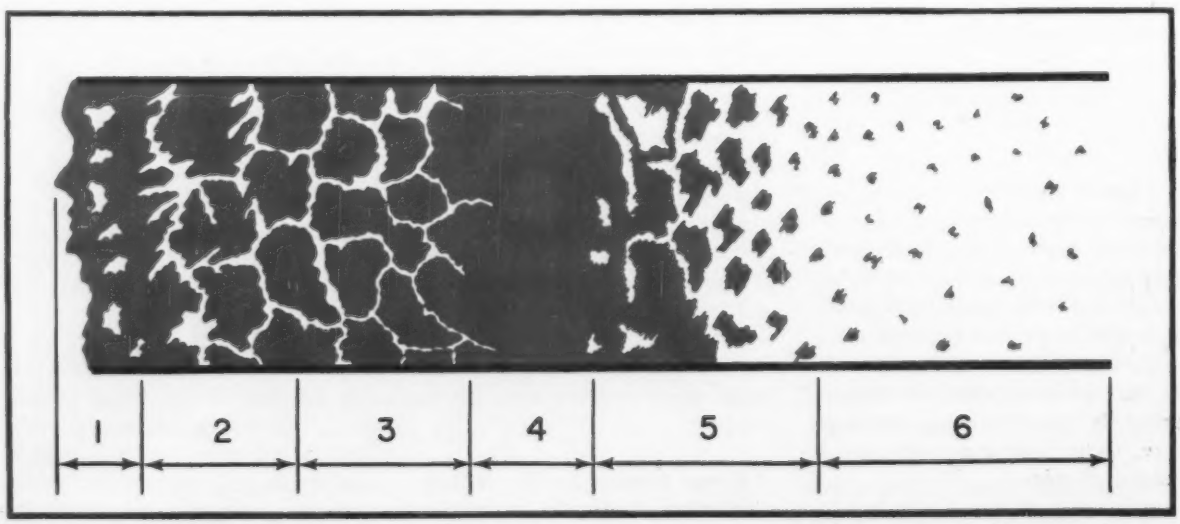


FIG. 2: Graphically shown are those structures that can be obtained upon slow cooling from the carburizing temperature. In this case, a portion of the steel is permitted to absorb carbon without limit.

ONE-MAN SYSTEM: Datex linear encoder system at Pacific Tube Co., automatically records length.

Electronics Gages Tube Length

Hand measurement of tubing is usually slow. And where four people are involved, there's a good chance of error.

A new electronic system now does the job quickly and accurately.

▪ Slow and often inaccurate hand measuring and tallying of tubing has been replaced at the Pacific Tube Co., Los Angeles, by an electronic linear encoder system. The new system, built by Datex Corp., Monrovia, Calif., cuts costs and makes measurements much faster. And it's far more precise because human error is minimized.

The old way required four people. One man held the steel measuring tape at one end of each tube while another read the length at the other end. The third man wrote down the lengths which were called out to him. Still another person was needed in the office to transcribe the written notes onto a typewriter form.

In contrast, the new method is simple, fast and accurate. The bale to be measured is rolled off the inspection table in a single layer onto the measuring table. Tubes are pushed against a stop, or "zero line." Then the operator presses a stop on a small control handle against the other end of each tube and pushes a "record" button on the grip.

When the "record" button is pressed the length of tube is accurately measured. And, this measurement is printed simultaneously in feet and inches on a final tally sheet in the shipping office by an adding machine. Footage in any lot can be obtained right after the final tube is measured by pressing the "total" button on the adding machine.

Three Components — The new linear encoder system has three main components: A Datex Model LE-101 linear encoder assembly. a Datex K-706 control chassis, and a Datex-Monroe Data/Log.

The encoder assembly supplies a digital coded output. The control chassis stores the encoder's output, translates it into feet and inches, and provides the necessary control functions for operation of the Datex-Monroe Data/Log.

Printout is on the Data/Log. Ten columns (4 decimal digits each) are programmed with a carriage return after the tenth column. The Data/Log contains an accumulator to total all the recorded measurements in feet and inches.

The system is extremely fast; the measuring handle may be moved immediately (25 microseconds) after depressing the "record" button without affecting readout accuracy.

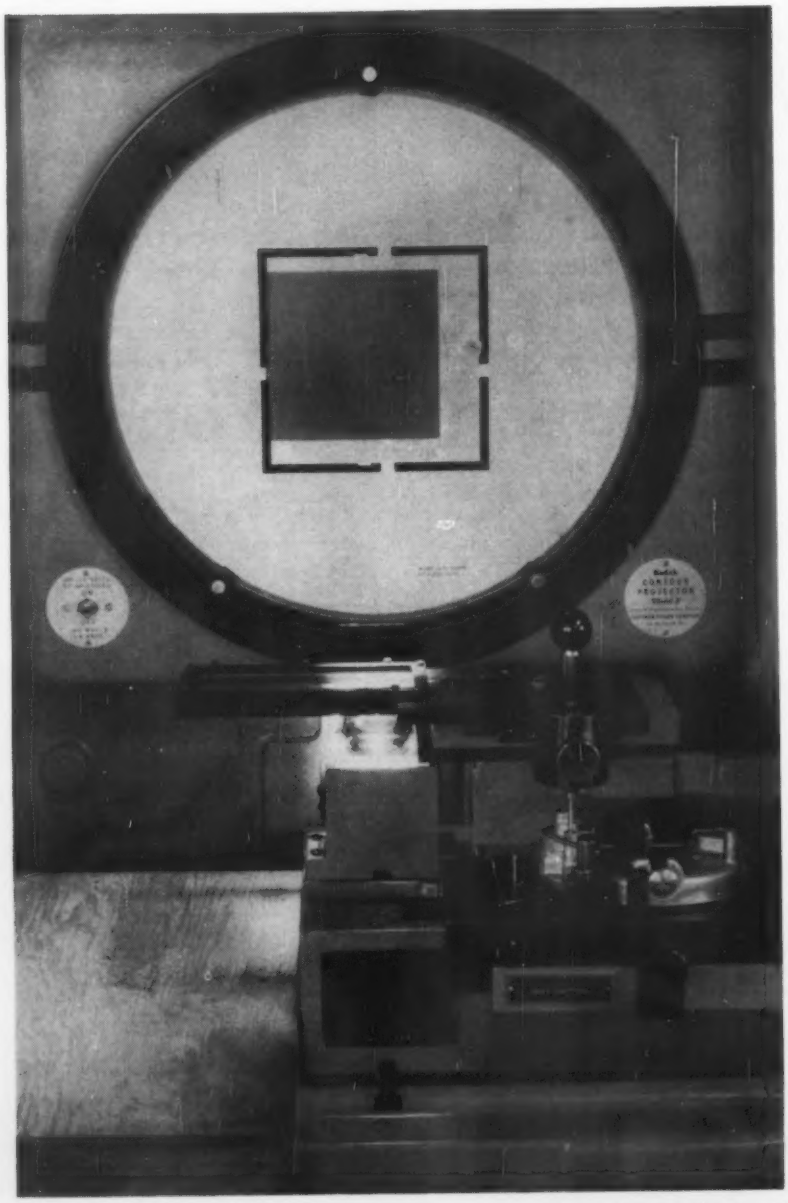
Optical Gaging Quick-Checks Blind Holes, Tricky Surfaces

Two uses for optical comparators are growing rapidly. One is "measurement by tracing." The other: High-intensity illumination.

▪ How do you check "blind" internal contours or keep tabs on locations of one-way holes?

You can spot the holes with height gages and other mechanical measuring devices. Or you can slice open samples of hollow parts and run a template check. But these techniques take time—lots of it.

Optical gaging offers a short cut. By probing internal contours or one-way holes—then checking results on a comparator screen—errors are spotted quickly.



BOX-IN-A-BOX: Probe, plus pattern on screen, shows in 5 minutes if 12 holes in housing are located correctly. Job formerly took one hour.

Simple Process—The technique is called "measurement by tracing." Simple to do, it involves a "probe" connected to a "follower." The shadow of the follower moves with respect to tolerance lines on the screen of an optical comparator.

It's common sense that magnification of errors on a screen tells you more than 1:1 gaging by hand. This is especially true of blind holes. And yet, relatively few metalworking plants use this time-and-money-saving technique, even when they must try to keep inspection geared to high-speed machine output.

For example, an automatic driller-reamer that turns out 900 precision parts per hour can be mighty handy. But let it get out of whack and it will make 900 pieces of scrap just as fast. That's what a maker of electric meter housings learned before putting in optical tracing equipment to backstop the operation.

Double Savings—The location of 12 holes in each housing must be accurate to within 0.002 in. Formerly, a skilled inspector took one hour on each housing to measure hole locations manually. Now, a machine operator does it in five minutes on an optical comparator. The result: tracing techniques save the firm some $4300 yearly on inspection costs alone, and thousands more because of fewer rejects.

In another case, two lands and

undercuts inside a valve housing caused an inspection bottleneck for an automotive firm. Checking these internal dimensions to ±0.0025 in. called for slicing in half one housing out of every 400 to 800 produced. It took 90 minutes to slice each part and inspect it.

Sample More Often — Now, checking these four inside dimensions by the tracing technique takes just two minutes. With the optical gage, one part in every 70 gets checked. If there's any machine trouble or a change in part design, the optical gage is a quick way to do 100-pct inspection until everything is going smoothly again.

Sometimes 100-pct inspection is necessary, but optical gaging can cut the time and money involved. It used to take a missile maker 24 minutes to check 20 dimensions inside a contoured blind hole with mechanical devices. A switch to the tracing technique cut this time to a fraction over eight minutes per piece. This will amortize the cost of 23 new optical comparators in a year's time—a five-figure saving.

Surface Brightener — Another little-known optical gaging kink literally throws more light on the problem of surface defects. The technique, known as "high-intensity illumination," is simply a way of boosting the conventional optical comparator's ability to see. By focusing light from a glowing filament on the surface to be examined, you can see details invisible to the naked eye or un-aided comparator.

The high-intensity unit was introduced recently by Eastman Kodak Co. as a standard comparator accessory. It permits close inspection of such things as cracks and faults, crystalline deposits, coating coverage, oxide and scale deposits, etched surfaces, cast surfaces, blind-hole interiors.

See the Point — For example, drill manufacturers should be able to use high-intensity illumination to check their products with more speed and accuracy. The unit's bright eye brings into sharp, multi-dimensional focus such key check points as the web, land, chisel edge, and lip. Similar checks might be applied by makers of end mills and other cutting tools where end configuration is important to tool life and performance.

Tracing Technique Finds Many Uses

Numerous firms are turning to the optical-comparator technique of "measurement by tracing." For example:

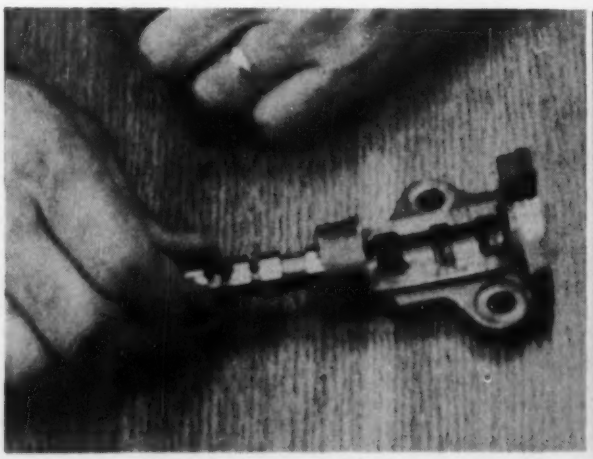
An arms manufacturer checks internal ejector cams for guns.

An auto manufacturer measures cam contours and lobes, also airfoil contours of transmission turbine blades.

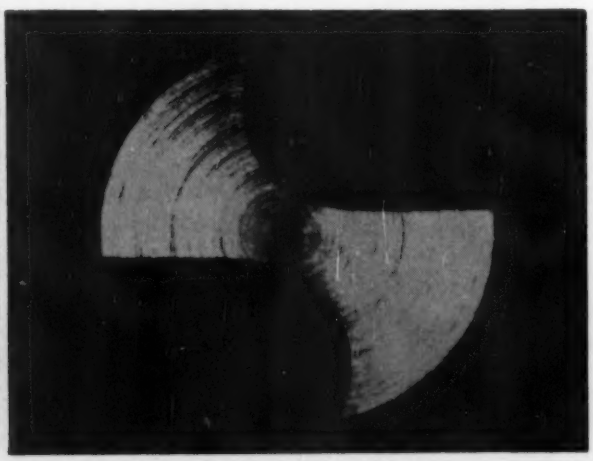
A producer of cooling systems simultaneously checks flute contours, spacing concentricity, and helix angles on compressor rotors.

An aircraft builder checks propeller "stop levers."

A missile contractor measures nose cones for wall thickness and accuracy of inner and outer contours.



QUICK JOB NOW: Slicing this valve housing and measuring two critical lands and undercuts used to take 1½ hours. Comparator takes 2 minutes.



"HI-I" LIGHTING: Point of twist drill, illuminated by high-intensity light beam, shows surface characteristics in magnified screen image.

Electric Process Welds Rail Into Continuous Ribbons

To most people, the clickety-clack of train wheels on bolted rails isn't an unpleasant sound.

But to railroad men it's an ominous one. It foretells millions of dollars in damage to equipment, freight and roadbed.

Hence the keen interest in a fast, low-cost way to weld rails.

▪ A Swiss rail-welding system that may save U. S. railroads millions of dollars annually is now being built in this country by Chemetron Corp.

The first automatic electric rail-welding system to be made here, it removes the last barrier to large-scale use of continuous-welded rail. This would mean an end to the clickety-clack of train wheels on bolted rail joints—and more important, its damaging effect on rolling stock, freight, and the track itself.

Chemetron obtained exclusive U. S. manufacturing rights to the patented system a year and a half ago from H. A. Schlatter AG., Swiss producer of resistance welding machines. The first American-built system has been sold to the Southern Pacific Railroad. Another has been under lease to the Great Northern Railway and the Louisville & Nashville Railroad.

Big Savings — U. S. railroads have been interested in welded rail ever since it was introduced almost 30 years ago. Surveys in the last five years by the American Railway Engineering Assn. show that welded rail saves an annual

RAIL PUSHER: Treadmill-like conveyors developed by Link-Belt Co. alternately grip and push rail which eventually becomes a continuous quarter-mile length.

BIG SQEEZE: Ends of two 39-ft rail sections are joined by flash butt resistance welding process in specially equipped railroad car. Unit applies 50-ton blow.

average of $981 for every mile of track. It lasts years longer than bolted rail and costs far less to maintain.

But high cost of previous welding methods has kept railroads from widely adopting welded rail. Its main uses to date have been at points with difficult maintenance and replacement problems, such as tunnels, grade crossings and station platform areas. These make up less than 1 pct of the nation's rail mileage.

With its new NCG system (named for the firm's National Cylinder Gas Div.), Chemetron says railroads can now install continuous-welded rail for less than the cost of the bolted-joint type.

Fast With Small Crew—The new system is fast. It completes an entire operation in about four minutes, and with a crew of only seven men.

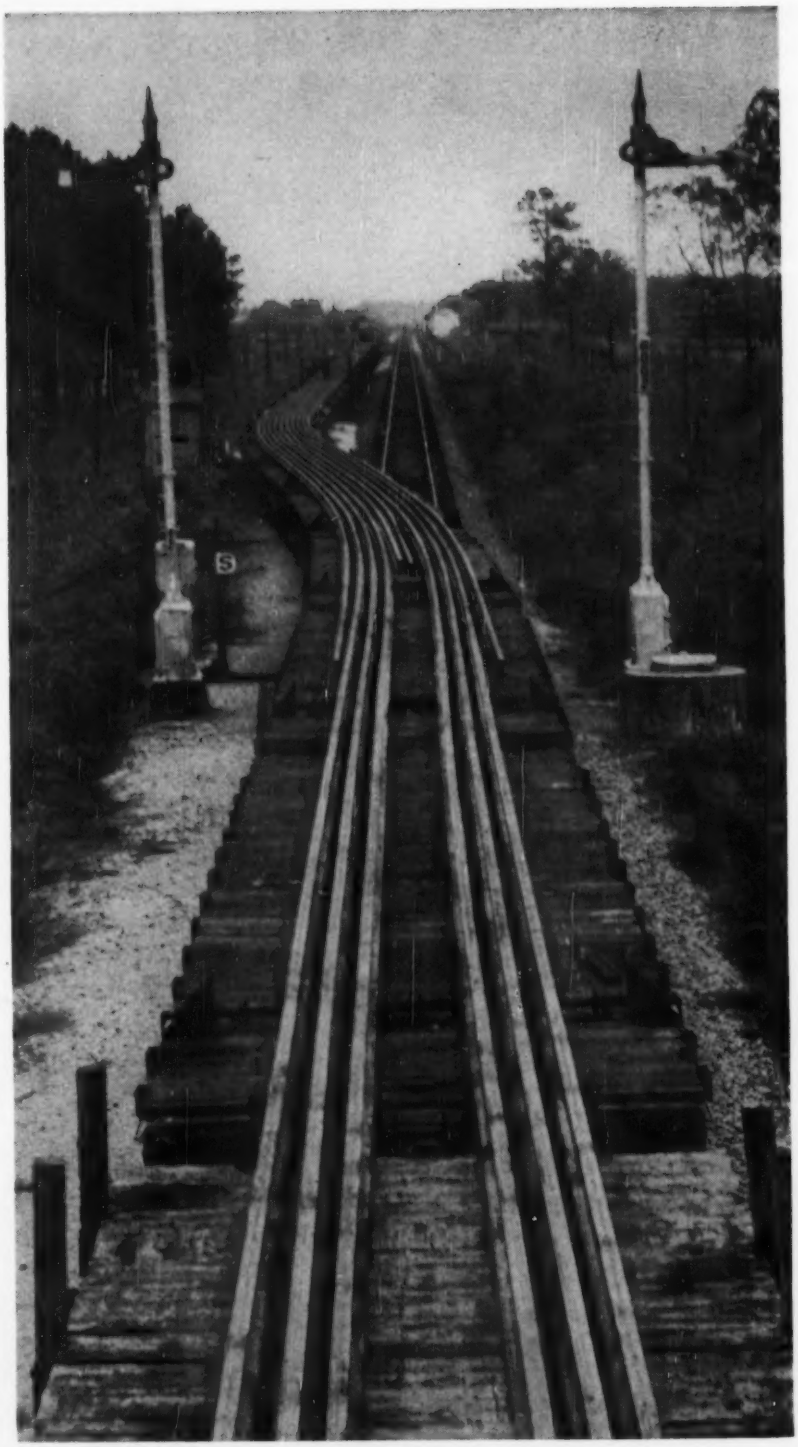
It also claims the distinction of being the first rail-welding system that can be operated off commercial power lines. For remote locations, it has its own mobile power unit.

Rails are fed into the welding unit mounted in its own railroad car. Rail ends are pre-heated by electric current to a plastic, molten stage. Then they're welded with an upset forging blow of more than 50 tons to form the flash butt resistance weld.

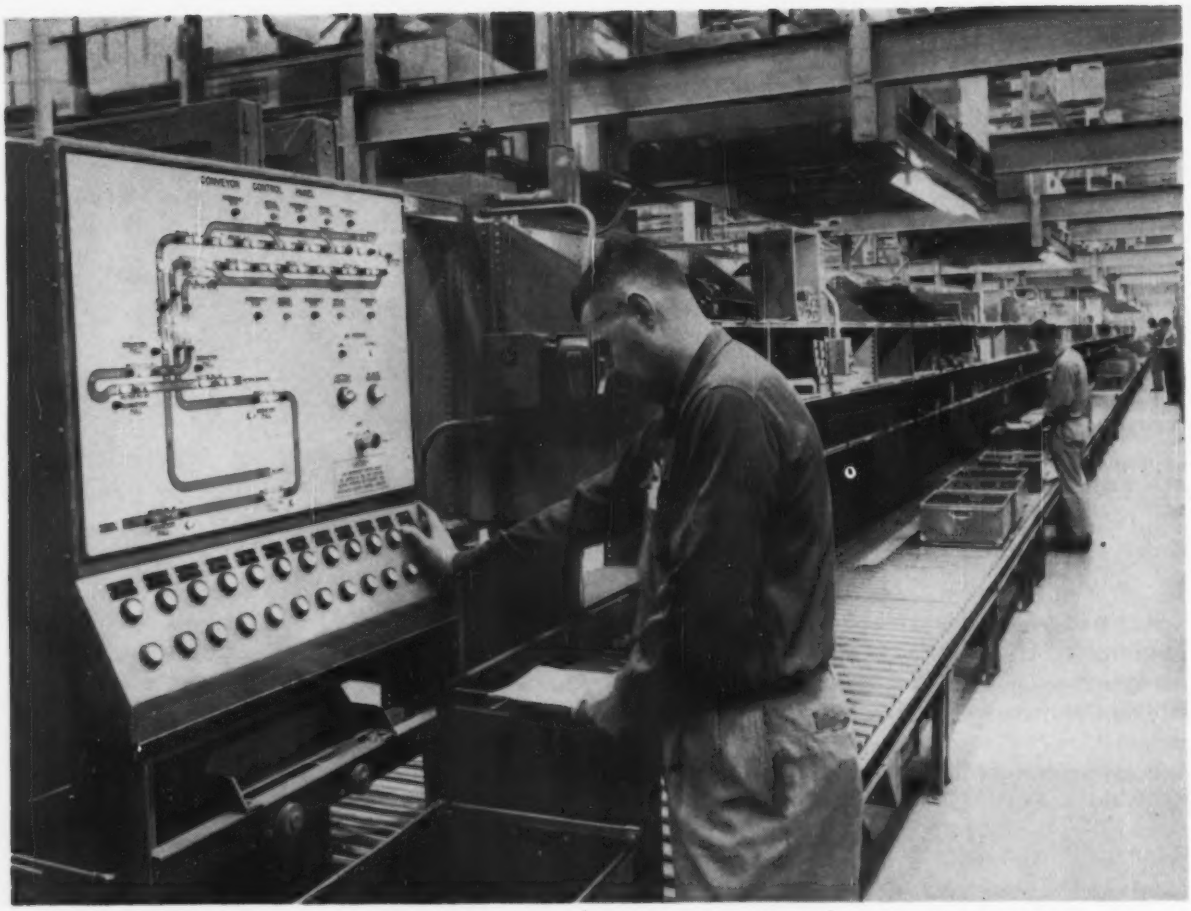
Uses Belt Grinding — Excess molten metal is sheared off the joint. Then the weld moves automatically to the next operation where the joint is ground smooth and tested. The system employs belt grinding, instead of abrasive wheels. This does away with the danger of grinding-wheel burns.

Quarter-mile strings of welded rails are stretched out on a train of 34 flat cars. When about a dozen strings are laid side by side or several layers of rails are stacked on the cars, they are taken to the required location. It may be a short distance or hundreds of miles from the welding site. The long rails are flexible, bending when the train rounds curves or travels up and down grades.

Two rails at a time may be removed from the flat cars. This is done by anchoring the rail ends, then pushing the cars out from under the anchored rails with a locomotive.



LONG LOAD: Quarter-mile ribbons of rail welded by the new NCG process are transported on 34 flatcars to the place where they'll be laid. The continuous welding system is already in use by several American roads.



NERVE CENTER: Dispatcher on order-picking line presets tabs to deflect hampers at desired areas.

Parts Routing Goes Automatic

Any plant-wide conveyor system cuts down on in-transit handling.

This one goes a step further: it does its own routing as well.

▪ Automatic routing of parts and equipment is featured in a plant-wide conveying system at Western Electric Company's new Solon, Ohio, distributing house. The equipment, built by The Alvey-Ferguson Co., Cincinnati, consists of live roller, gravity roller, belt, roller flight and truck towing conveyors.

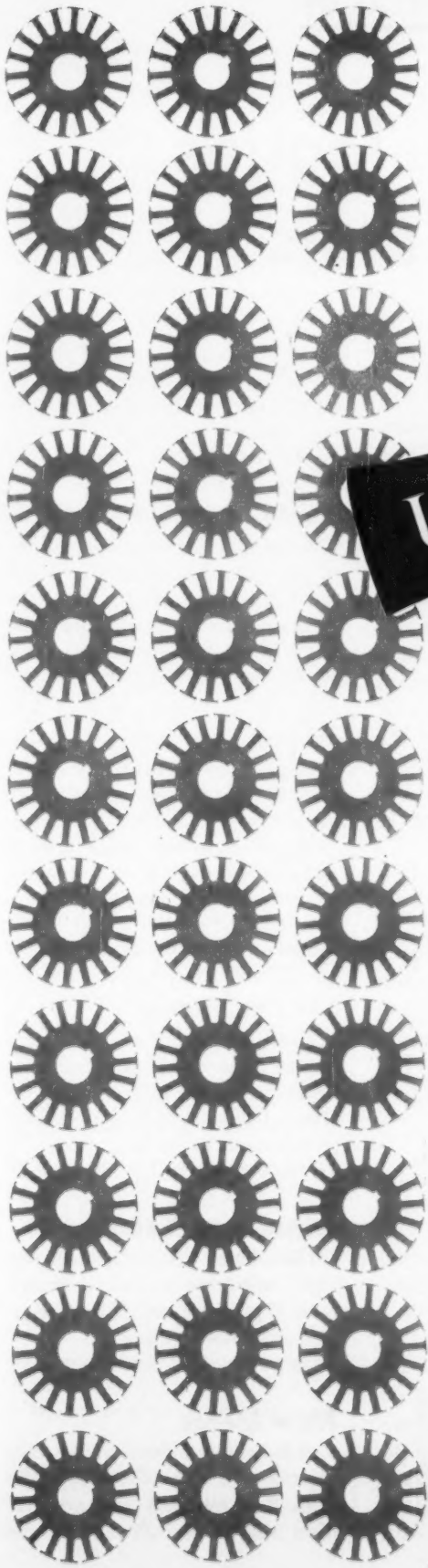
Parts and equipment are placed in aluminum trays. Then they're automatically transported through rebuilding operations and directed to the right warehousing areas by means of preset pin deflectors on the trays.

One of the more striking aspects is the conveying system used for order picking. The order is collected in a hamper placed on top of a special carrier. If more than one hamper is needed for a given order, extra units are placed on the conveyor behind the carrier. They'll go to the same destinations.

Dispatcher Sets Tabs — Before order picking begins, a dispatcher reviews the order. From his knowledge of where the various items are stored he sets the carrier's tabs. The tabs then activate deflectors so the unit will be discharged at stations where pickups are to be made.

Carrier and hamper travel through the order-selecting process on a belt-driven live roller conveyor line. Paralleling this conveyor and outside of its is a gravity roller line onto which the carrier and hamper are shunted to receive articles. When all items have been gathered at a particular station, a slight push moves the carrier and hamper back onto the live roller conveyor for transport to the next station.

After order picking, emptied carriers are returned to the dispatcher by means of a combination belt and roller conveyor line.



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New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 101.

Power Transmission

Designed for manual or power transmission of rotary motion, new right angle, bevel gear drive units are featured in a bulletin. In 14 basic models, units range from 1/5 to 2½-hp capacity. They have many high and low performance aircraft uses. (Airborne Accessories Corp.)

For free copy circle No. 1 on postcard, p. 101

Heating Coil

Heating coils are subjects of a bulletin. Covered are standard steam coils, steam distributing coils and hot water coils. (American Air Filter Co.)

For free copy circle No. 2 on postcard, p. 101

Radial Saws

Radial saws described in a 12-page catalog cut light metal sheeting, tubing, extrusions, etc. Action photographs show 42 different operations. (Delta Power Tool Div., Rockwell Mfg. Co.)

For free copy circle No. 3 on postcard, p. 101

Brush Plating

Practical brush plating is covered in a 12-page booklet. Reviewed are: touching up, precision fitting of bearings, soldering on aluminum and stainless steel, improving adhesion of sprayed metals, printed circuit plating, resizing of mismachined components. (Marlane Development Co., Inc.)

For free copy circle No. 4 on postcard, p. 101

Surface Plates

Relapping facilities for granite surface plates are offered in a bulletin. Facilities handle any type granite surface plate. (Herman Stone Co.)

For free copy circle No. 5 on postcard, p. 101

Vapor Vent

Eliminating hazards of combustible vapors accumulating at ground level is a new vapor vent. It directs escaping vapors upward and allows storage tanks to breathe more freely. A bulletin supplies details. (OPW Corp.)

For free copy circle No. 6 on postcard, p. 101

Steam Cleaner

Heavy machinery and equipment can be cleaned six times faster by a new steam-hydraulic cleaner. So says a bulletin which gives details. (Homestead Valve Mfg. Co.)

For free copy circle No. 7 on postcard, p. 101

Glass-base Teflon

Glass-base Teflon impregnated tapes and laminates are described in an 8-page bulletin. (Continental-Diamond Fibre Corp.)

For free copy circle No. 8 on postcard, p. 101

Flow Meter

A bulletin introduces a glass tube variable-area flowmeter. This indicates flow rate and also synchronizes secondaries. The meter can

directly connect to transmitting, recording, or controlling instruments. (Fischer & Porter Co.)

For free copy circle No. 9 on postcard, p. 101

Gas Piping

Production, space and cost benefits in continuous distribution of gases by custom-built manifold installations are described in a 28-page brochure. Duplex, simplex and portable systems pipe oxygen, hydrogen, nitrogen, helium, argon, acetylene, etc. These serve welding, cutting, heating, flame hardening, flame blasting and oxygen lance operations. (Chemetron Corp.)

For free copy circle No. 10 on postcard, p. 101

Seam Welder

Air operated, a press type, single phase seam welder handles a wide range of commercial welding jobs. A brochure describes the machine. (Sciaky Bros., Inc.)

For free copy circle No. 11 on postcard, p. 101

LP-gas Lifts

LP-gas lift truck cylinders are presented in a 6-page folder. (Linde Co.)

For free copy circle No. 12 on postcard, p. 101

Mercury Switch

A data sheet describes a new low-angle mercury switch. It is an extremely small, single pole, double throw switch. Differential angle is .15° max. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 13 on postcard, p. 101

Bed-type Miller

A 4-page bulletin describes a bed type milling machine. Sturdily constructed for accurate, rapid milling of light and medium production work, the machine comes with hydraulic or manual feed. (Producto Machine Co.)

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Alloy Addition

Ferrocarbo briquettes and their effect on microstructure and ma-

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CHISHOLM-MOORE HOIST DIVISION
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TONAWANDA, N.Y.
NEW YORK • CHICAGO • CLEVELAND
In Canada: McKinnon Columbus Chain Ltd., St. Catharines, Ont.

OSBORN® *announces:*

a new concept in power brushing tools

How **TY® BRUSHES** will significantly cut your finishing costs

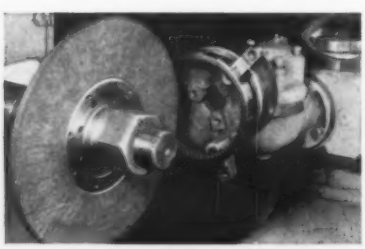
Designed for jobs *beyond the reach* of standard wire power brushes, Osborn TY® Tool Brushes are literally a new concept in finishing tools.

Where rotary files, abrasive stones or belts, tumbling and shot blasting equipment have been used—TY Brushing Methods now do many of these jobs *better . . . at significantly less cost.*

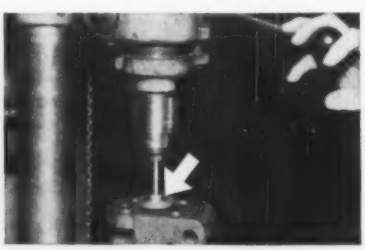
These exclusive TY Brush advantages have been proved through extensive field tests—

- *Maximum of work efficiency with minimum of pressure*
- *Greatly increased brushing action strength*
- *Positive control over area of brush contact*
- *Complete uniformity of finish*
- *Exceptionally long brushing tool life*

Osborn TY Brushes will give you a higher rate of output . . . better product quality . . . lower end-of-service cost. Write or call us today for full information. No obligation, of course. *The Osborn Manufacturing Company, Dept. F-77, Cleveland 14, Ohio.*



Blending Gear Tooth Edges *and deburring in a single precision operation is done with Osborn TY Monitor® Brush running at 1750 rpm on Brushamatic® 3A Machine.*



Cleaning and Finishing *internal surfaces of machined castings is done with an Osborn TY Ringlock® Brush mounted on a simple drill press setup. Operation is rapid, thorough—low cost.*

Osborn Brushes

BRUSHING MACHINES
BRUSHING METHODS
POWER, PAINT AND MAINTENANCE BRUSHES
FOUNDRY PRODUCTION MACHINERY

FREE LITERATURE

chinability of gray iron castings are covered in a 16-page booklet. Discussed are effects on cupola melting practice, machinability, graphite, sulphur, iron carbide, iron phosphate, structure and segregation. (Electro Minerals Div., The Carborundum Co.)

For free copy circle No. 15 on postcard, p. 101

Heat Exchangers

Stainless steel heat exchangers presented in a bulletin come in 19 models, in one, two, and four-pass designs. (American-Standard, Ross Heat Exchanger Div.)

For free copy circle No. 16 on postcard, p. 101

Lubricants

Effects of lubricants on "wearing in" of new machinery is discussed in a newsletter. (Alpha-Molykote Corp.)

For free copy circle No. 17 on postcard, p. 101

Surface Grinder

Precision grinding of flat, concave and convex surfaces of small work is done by a new rotary surface grinder. It has a 6-in. magnetic chuck, 10-in. vertical capacity to center of wheel, 4-in. grinding stroke and 12½-in. swing inside of guard. (Heald Machine Co.)

For free copy circle No. 18 on postcard, p. 101

Propane Diluter

"Package units" presented in a bulletin accurately mix propane or butane with air. They supply standby fuel or maintain heating, heat processing and refrigerating operations when regular gas supplies are temporarily cut off. (Selas Corp of America.)

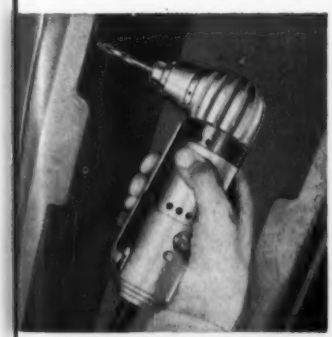
For free copy circle No. 19 on postcard, p. 101

Dust Control

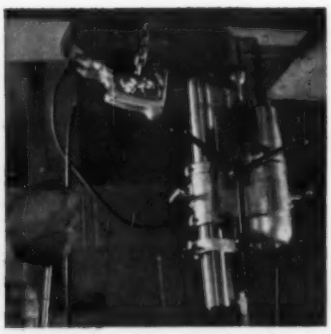
To assist engineers concerned with industrial dust control problems of all kinds, a bulletin tells how others solve them. (The Flexaust Co.)

For free copy circle No. 20 on postcard, p. 101

There's a Black & Decker Drill powered for every job!



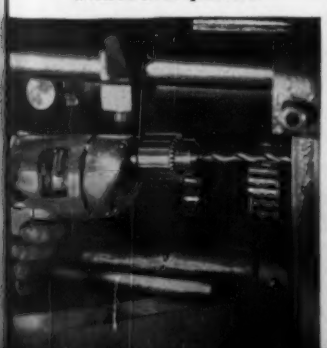
LITTLE SHORTY'S the drill you want for those hard-to-get-to, around-corner jobs. Gets in tight spots! Excellent for small unit assembly.



DRILLS UPSIDE DOWN! B&D Magnetic Drill Press sticks to the wall like a fly; operates manually or with exclusive remote control.

TREMENDOUS TORQUE for the tough jobs. ½" H.D. Holgun® is geared and powered to take on the hard ones. Compact to work in close quarters.

MOST POWERFUL drill of its size available, the ¼" Standard! A rugged tool with plenty of zip in reserve. Fully reversible; positive drive clutch.



71% of purchasing agents say make mine Black & Decker!

A recent industrial publishing company survey reveals that when purchasing agents need electric tools most think first of Black & Decker! One reason why: 33 *different* drills each designed to give you the power you need *plus* easy handling and long, troublefree life!

If you have a drill problem—a small hole in trim to a large hole up among the structural steel—be sure to see Black & Decker. Better still, mail the coupon for a free demonstration of our drill line. THE BLACK & DECKER MFG. CO., Dept. 0901, Towson 4, Maryland. (In Canada: P. O. Box 278, Brockville, Ontario).

Look Under "TOOLS-ELECTRIC" in Yellow Pages

Leading Distributors Everywhere Sell

B&D Black & Decker®

Quality Electric Tools . . . Power-built for top performance

MAIL COUPON FOR FREE DEMONSTRATION

THE BLACK & DECKER MFG. CO., Dept. 0901, Towson 4, Md.

☐ Please arrange for a demonstration of the following drill(s) .....

☐ Please send me additional information.

Name..... Title.....

Company.....

Address.....

City..... Zone..... State.....

R. W. Creamer, V.P., checks x-ray films of tank welds.

Picture of a man saving $400 per unit

It's done with Kodak Industrial X-ray Film, Type AA

Creamer and Dunlap, Inc., make pressure vessels—big ones, 67 ft. long by 9 ft. in diameter. Because they radiograph every inch of every weld to determine soundness, they can use thinner plate. This results in about 10% less weight with attendant savings in fabrication, handling and shipping. Altogether it adds up to as much as $400 per unit.

What's more, radiography helps to assure customers of a high-quality, safe product.

This company switched to Kodak Industrial X-ray Film, Type AA, because, "This film," they say, "is faster and has superior contrast, definition and radiographic sensitivity."

Your x-ray dealer and the Kodak Technical Representative will gladly tell you how Kodak film can improve your radiographic operation and help you get more out of your present x-ray or gamma-ray equipment. It can pay you to get in touch with them.

Read what Kodak Industrial X-ray Film, Type AA, does for you:

- Speeds up radiographic examinations.
- Gives high subject contrast, increased detail and easy readability at all energy ranges.
- Provides excellent uniformity.
- Reduces the possibility of pressure desensitization under shop conditions.

EASTMAN KODAK COMPANY, *X-ray Division*, Rochester 4, N.Y.

For inspection of welds, Kodak Industrial X-ray Film, Types AA, M, and KK, are available in the 70mm by 550 ft. package, as well as in standard sheet sizes.

Kodak

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Graphite Pipe

Impervious graphite pipe and fittings are covered in a data sheet. Pipe is armored in glass fiber, comes in 72-in. lengths. It's corrosion proof. (Falls Industries, Inc.)

For free copy circle No. 21 on postcard

Bending Machine

A 4-page bulletin announces a new heavy-duty "zig zag" web bending machine. It fabricates bar joists. Completed webs run 8 to 24-in. high, 10 to 24-in. pitch, from 30-ft straight bar lengths. (McBeth Machinery Co.)

For free copy circle No. 22 on postcard

Electrical Standards

Essential differences between NMTBA and JIC electrical standards appear in a 4-page report. The latter, while very similar to NMTBA standards, also cover equipment considered in NMTBA standards to be individual customer preferences, often subject to negotiation. (National Machine Tool Builders' Assn.)

For free copy circle No. 23 on postcard

Air Freight

Shippers of metal products can boost profits by using air freight, a 16-page booklet points out. It tells why. (United Air Lines.)

For free copy circle No. 24 on postcard

Industrial Noise

A calculator helps predict room noise rise using fan "sone" ratings. Ratings consider not just sound pressure level but also effect of frequency on the human ear. Originally designed for air-moving fans, the system can apply to any noise making equipment. (For free calculator write on company letterhead to Propellair Div., Robbins & Meyers, Inc., Springfield, Ohio.)

Machine Tools

Two new publications detail: (1) a tape-run unit that mills, drills, reams, taps and bores, and (2) the remanufacturing of used milling machines. (Kearney & Trecker Corp.)

For free copy circle No. 25 on postcard

Drill Bushing

Literature introduces a new ceramic drill bushing for plastic tooling. A thin shell of ceramic (0.020-in. thick) is fused onto the bushing outer surface. This insulates plastic potting material from excess heat buildup in the bushing. (American Drill Bushing Co.)

For free copy circle No. 26 on postcard

Platinum Metals

"Platinum Metals Review" is a 40-page quarterly publication on research of platinum metals. Latest issue contains items on gamma radiography with iridium, platinum plating of zirconium. (J. Bishop & Co.)

For free copy circle No. 27 on postcard

Bath Pyrometry

How to simplify bath pyrometry is told in a folder. It discusses an expendable immersion thermocouple cartridge for openhearth and electric-arc furnaces. (Leeds & Northrup Co.)

For free copy circle No. 28 on postcard

Electric Station

Pre-engineered load distribition centers are announced in a bulletin. These packaged substations offer great savings over custom designed models; they need no special engineering time. (I-T-E Circuit Breaker Co.)

For free copy circle No. 29 on postcard

Die Steel

Free machining, air hardening die steel is presented in a 4-page

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **1/15/59**

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
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101	102	103	104	105	106	107	108	109	110

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

PLEASE TYPE OR PRINT

Name .....

Title .....

Company .....

Co. Address .....

.....

City .....Zone ....State .....

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77, Village Station

NEW YORK 14, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

FIRST CLASS PERMIT No. 36 NEW YORK, N. Y.

POSTAGE WILL BE PAID BY

THE IRON AGE

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Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **1/15/59**

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PLEASE TYPE OR PRINT

Name .....

Title .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

FREE LITERATURE

data bulletin. This steel has use in blanking and forming punches; dies and rolls; trimmer dies, cold or hot; straightening and banding dies, and gages. (Allegheny Ludlum Steel Corp.)

For free copy circle No. 30 on postcard

OBI Presses

Detailing a line of 2 to 85-ton OBI presses is a catalog. (Sales Service Mfg. Co.)

For free copy circle No. 31 on postcard

Chucks

Nearly 60 different chucks are reviewed in a 14-page catalog. Also covered: chuck keys, arbors, chuck repair parts, portable drill attachments. (Supreme Products Corp.)

For free copy circle No. 32 on postcard

Rugged Dies

High-quality carbon steel dies outlined in a bulletin form alloys used in aircraft and missile production. They fit any make press brake. Forming edges have superfine finish to avoid marring surfaces. (Dreis & Krump Mfg. Co.)

For free copy circle No. 33 on postcard

Butterfly Valves

Rubber seated butterfly valves are shown in a brochure. These valves are in extensive use in many metalworking plants today. Sizes range from 14 to 84 in. They serve blast furnace gas mains, water systems and waste disposal. (S. P. Kinney Engineers, Inc.)

For free copy circle No. 34 on postcard

Gages

Gages in a 12-page catalog measure microinches or miles, fractional seconds of arc, or roundness, flatness, etc. (Engis Equipment Co.)

For free copy circle No. 35 on postcard

Gage Logging

Computing and data processing systems and services for the metals industry are reviewed in an 8-page bulletin. It explains a gage logging system bringing advanced computer techniques to metalworking. (Computer Dept., General Electric Co.)

For free copy circle No. 36 on postcard

Work-holding Vise

A brochure shows a new precision universal angle vise. (Wesson Co.)

For free copy circle No. 37 on postcard

V-belt Life

Longer life from V-belt drives is possible, says a 12-page manual. It tells how to spot and prevent failures. (B. F. Goodrich Industrial Products Co.)

For free copy circle No. 38 on postcard

Blowtorch

Rapid heating, a portable blowtorch is offered in a data sheet. Torch produces 2200°F in seconds. It serves preheating, annealing, soldering, bending, etc. (Clements Mfg. Co.)

For free copy circle No. 39 on postcard

Precision Switches

Precision snap-action and mercury switches appear in a 24-page catalog. Types include: high-temperature, maintained contact, explosion proof, high capacity, proximity and oil tight. (Micro Switch Div., Minneapolis Honeywell Regulator Co.)

For free copy circle No. 40 on postcard

Band Machine

Faster production cutoff sawing at much lower cost per cut; that's what a circular promises for a new band machine tool. (Henry G. Thompson & Son Co.)

For free copy circle No. 41 on postcard

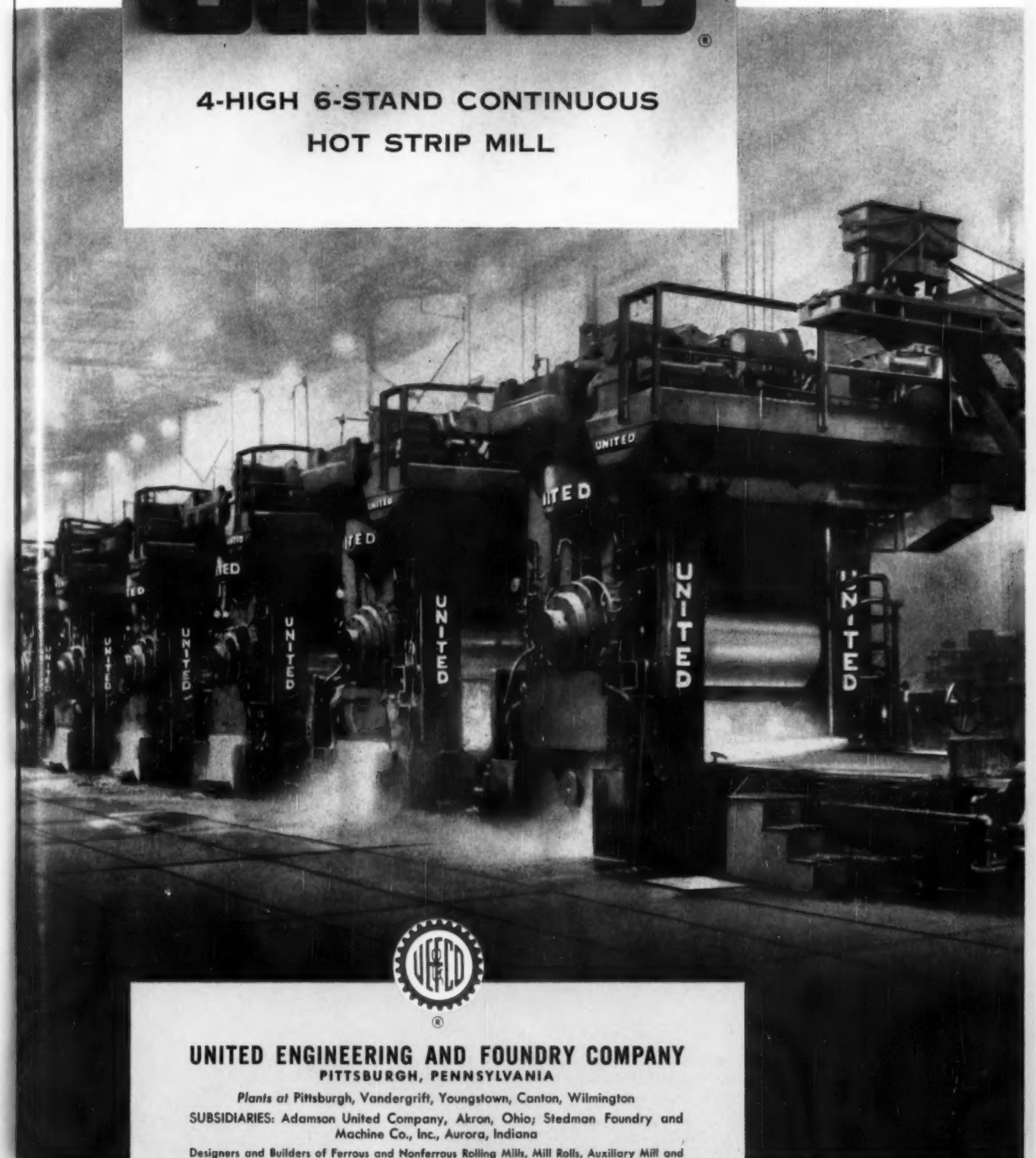
Aluminum Finish

Recently developed, an immersion material etch-finishes aluminum and aluminum alloys. Etch hides die marks and some structural imperfections. It gives a decorative finish, can be further surfaced with lacquer, anodizing, etc. (Kelite Corp.)

For free copy circle No. 42 on postcard

UNITED®

4-HIGH 6-STAND CONTINUOUS HOT STRIP MILL



UEFCO®

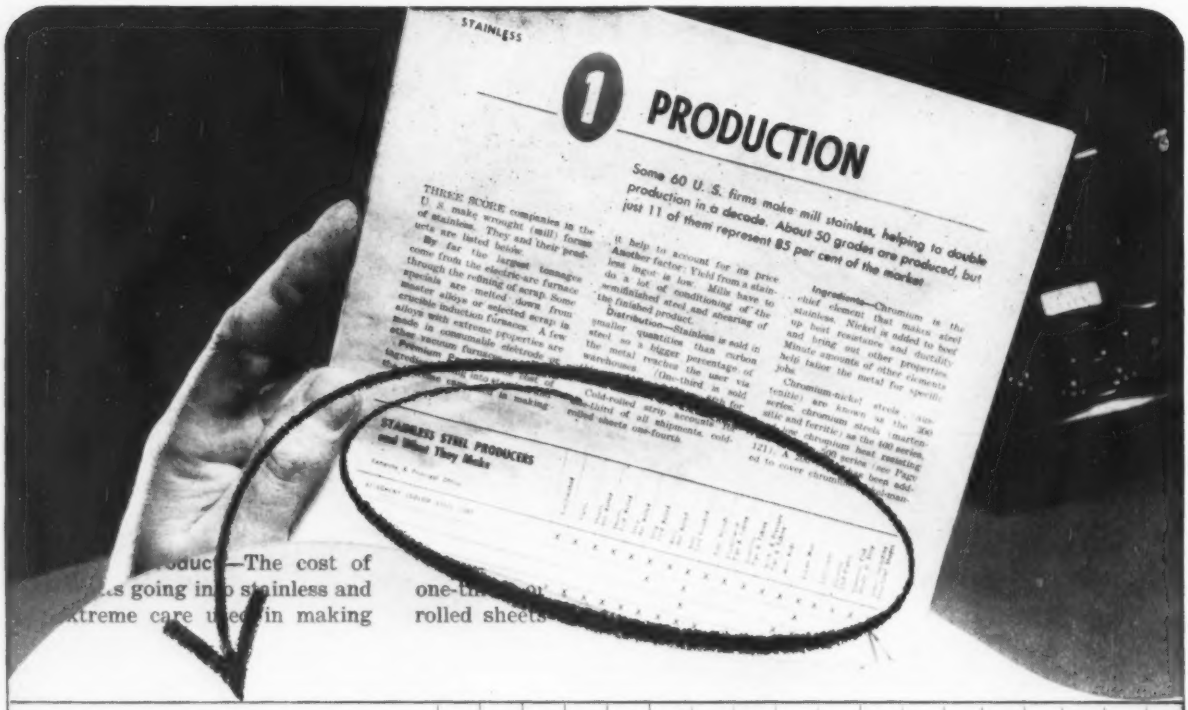
UNITED ENGINEERING AND FOUNDRY COMPANY
PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Experience**—the added alloy in **A-L Stainless, Electrical and Tool Steels


STAINLESS
1 PRODUCTION
Some 60 U. S. firms make mill stainless, helping to double production in a decade. About 50 grades are produced, but just 11 of them represent 85 per cent of the market
THREE SCORE companies in the U. S. make wrought (mill) forms of stainless. They and their products are listed below.
By far the largest tonnages come from the electric-arc furnace through the refining of scrap. Some specialty alloys are melted down from master alloys or selected scrap in crucible induction furnaces. A few alloys with extreme properties are made in consumable electrode or other vacuum furnaces.
Production—The cost of ... going into stainless and ... extreme care used in making ... one-third ... rolled sheets ...
Ingredients—Chromium is the chief element that makes steel stainless. Nickel is added to toughen and bring out ductility. Minute amounts of other properties help tailor the metal for specific jobs.
Chromium-nickel steels ... austenitic) are known as the 300 series, chromium steels martensitic and ferritic as the 400 series, chromium-heat resisting ... 200 series (see Page ... to cover chromium-manganese ...
Distribution—Stainless is sold in smaller quantities than carbon steel, so a bigger percentage of the metal reaches the user via warehouses. (One-third is sold ...
Cold-rolled strip, accounting for one-third of all shipments, cold-rolled sheets one-fourth.
STAINLESS STEEL PRODUCERS and What They Make

STAINLESS STEEL PRODUCERS and What They Make Company & Principal Office	Semifinished	Plates	Sheets, Hot Rolled	Sheets, Cold Rolled	Strip, Hot Rolled	Strip, Cold Rolled	Bars, Hot Rolled	Bars, Cold Finished	Tube Rounds	Electricweld Pipe & Tubing	Seamless Pipe & Tubing	Mech. & Pressure Pipe & Tubing	Wire Rods	Drawn Wire	Extrusions	Stainless Clad Plates	Stainless Clad Sheets or Strip	Other, Including Structural Shapes
ALLEGHENY LUDLUM STEEL CORP. Pittsburgh	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
						X		X						X				

Of the 60 producers of stainless steel...

only ALLEGHENY LUDLUM makes all sizes, shapes, finishes and analyses

In its November 4, 1957 issue, STEEL magazine published a complete run-down on the stainless steel industry. This article reveals that *only Allegheny Ludlum*, of the 60 some companies making stainless, produces all sizes, shapes, finishes and analyses.

This can save you considerable time and money. When you make Allegheny Ludlum your *one* source of stainless, you work with *one* sales engineer—*one* order, whether you buy sheet, strip, bars, tubing or whatever.

And, at the same time, you get the best technical service. A-L's crack research and development department is continually searching for new alloys, and better ways to use today's. Its findings are freely available to you through sales engineers, technicians and special literature.

Allegheny Ludlum follows the product from the melt through to finished form, has greater quality control over the stainless you buy. And since A-L makes all forms of stainless, you get unbiased recommendations as to what is best for your individual needs.

Profit by Allegheny Ludlum's status as the only one-source integrated supplier of all stainless forms. Call your A-L representative today . . . see how he can save you money and time. Or write *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*

WAW 7121

ALLEGHENY LUDLUM

for warehouse delivery of Allegheny Stainless, call RYERSON

Export distribution: AIRCO INTERNATIONAL

EVERY FORM OF STAINLESS . . . . EVERY HELP IN USING IT

New Materials and Components

Fasteners' Built-in Seals Prevent Leakage

Self-sealing, these fasteners serve where no-leakage seals are required. A self-lubricating Teflon shim, with a low co-efficient of friction, creates a permanent lubricant. It's set in a special O-ring groove in the head of each cold-headed stress fastener. This eliminates attrition and extrusion under pressure. Fasteners resist most chemicals, fuels, hydraulic fluids and synthetic lubricants, in a wide range of temperature variances. They can be re-used with no loss of sealing properties. Installation can be made with standard tools. They do not require gooping or extraneous sealing compounds. The self-sealing fasteners are designed to meet specifications of commercial and military users. They're available in a wide variety of materials and configurations. (Aero-State Co.)

For more data circle No. 43 on postcard, p. 101

Plastic Ropes Serve As Hoist Load Slings

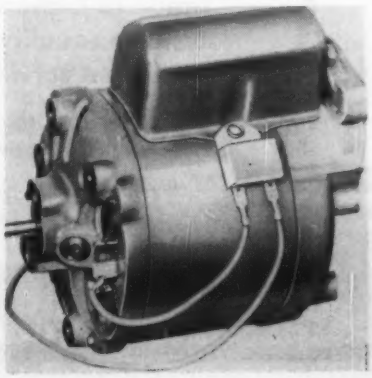
Plastic ropes fashioned from Mylar now serve as load slings in industrial hoists. A two-year constant-use test of the plastic slings recently completed shows these results: (1) Mylar already has outworn other non-metallic materials better than six-to-one; it's still in use, too. Mylar's unusually high tensile enables replacing 1-in. diam rope with easier-handled ½-in. plastic material. (2) Mylar isn't subject to load-caused kinks or sets of metallic cable tested. (3) Minor in-plant accidents caused by workmen cutting their hands on broken threads in metal slings has been completely eliminated. (4) Mylar doesn't scratch steel coil stock constantly being hoisted. (5) Dielectric properties enable the plastic to pass over "hot" power lines without shorting. The product is available in standard rope sizes from ⅛ to ⅞ in. (U. S. Plastic Rope Inc.)

For more data circle No. 44 on postcard, p. 101

Breakers Protect Fractional Horsepower Units

This overload unit protects fractional horsepower motors. It trips in response to either rising motor temperature or excessive current draw. The new breaker particularly adapts to fans, disposal systems, air conditionings, refrigerators, freezers, pumps and other items using fhp motors. Automatically, it shuts off power when motor heat or current rises dangerously; it restores operation when temperature or current drops. Actuation by temperature of the thermal element can be precisely varied to open the circuit at any stage of motor temperature or current rise. The unit will trip as often as heat or current rise recur or short circuits cause instant interruption. (Mechanical Products, Inc.)

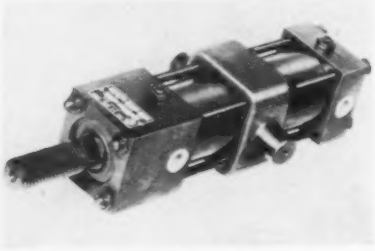
For more data circle No. 45 on postcard, p. 101



DESIGN DIGEST

Hydraulic Cylinders

New trunnion-mounted air and hydraulic cylinders serve heavy-duty uses. They feature positive adjustment and a one-piece trunnion. The solid, one-piece trunnion is supported and positioned by four threaded cylinder tie-rods. The trunnion is shifted by loosening the tie-rod self-locking nuts just enough to permit rotation of the



rods by their solid hex ends. This rotation provides precise movement of the trunnion to the exact location desired. Pressure ratings are 200-psi air and 1000-psi hydraulic. (S-P Mfg. Co.)

For more data circle No. 46 on postcard, p. 101

Ball Valves

An extensive line of ball valves is now available for missile in-flight and ground support applications. The valves handle standard fuels

and oils, high energy fuels, oxidizers, coolants and cryogenics. Simple in design, the rugged valves are lightweight, small in size. When functioning as drain, selector, fill and flushing valves, this ball type design can be actuated by manual, mechanical or electrical means. (Koehler Aircraft Products Co.)

For more data circle No. 47 on postcard, p. 101

NEW BOOKS

"Handbook On Continual Casting" is in German. Some text, keys to illustrations, and charts appear in French and English. Without its glossaries of essential technical terms (in German-English-French, English - German - French, and French-German-English), reading of this book might be exceptionally difficult. Also helping are some 2000 illustrations. It compacts into one book what has been available only in a multitude of publications and in 3000 patent files. And all these contain significant facts on continuous casting. 928pp. Aluminium-Verlag GmbH; Jagerhofstrabe 26/29; Dusseldorf, Germany.

"Slotted & Recessed Head Tapping Screws & Metallic Drive Screws" is a joint ASA and ASME issue. $4 per copy. American Standards Assn., 70 E. 45th St., New York 17.

"Marks' Mechanical Engineers' Handbook" (sixth edition) supplies quick answers to questions in every branch of mechanical engineering. Up to date data appears on practically every aspect, including railway, nuclear, missile, structural, handling, design and power engineering. 2320pp. $23.50 per copy. McGraw-Hill, 327 W. 41st St., New York 36.

"Instrument & Control Engineering" is a vocational and professional monograph. In short, it introduces the industry to someone who knows nothing or very little about it. Students, councellors, personnel men and apprentices probably can make best use of it. So could anyone trying to talk young people into getting into this field. 46pp. $1 per copy. Bellman Publishing Co., P. O. Box 172, Cambridge 38, Mass.

Punches & Dies
Since 1903
Made to highest standard and uniform quality thus insuring maximum service.
Rivet sets-round, square, oblong Punches, and Dies carried in stock.
Write Dept. B for catalog 60 and new stock list
GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL STREET · CHICAGO 8, ILLINOIS

PERMASEAL® Idlers – installed for 42", 48" and 60" belts at 10,000 ton per day coal handling facility on Ohio River.

NEW-TYPE CONVEYOR IDLERS STRETCH GREASING INTERVALS TO YEARS

Grease 'em by-the-month idlers are expensive to maintain. The Jeffrey PERMASEAL® Idlers in this coal handling system won't need greasing for a year—maybe several years. Their slightly higher initial cost (due to superior bearing protection) is quickly absorbed by unparalleled low cost of maintenance.

Bearing failure is the major cause of idler failure. The PERMASEAL® Idler's unique double seal design protects bearings as they have never been protected before. On coal handling systems and dirty, abrasive handling jobs, Jeffrey PERMASEAL® Idlers are proving their ability to outlast any other idler on the market.

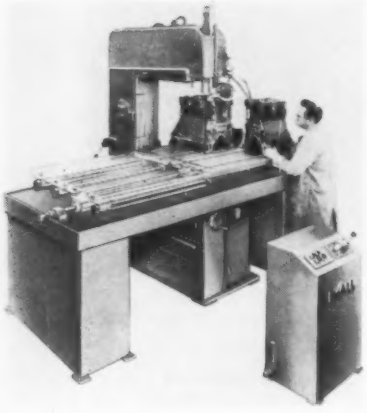
Get more data on PERMASEAL® Idlers. Your materials handling supervisor should have all the facts on PERMASEAL® Idlers. Contact a Jeffrey distributor, or write The Jeffrey Manufacturing Company, 925 North Fourth Street, Columbus 16, Ohio.

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

New Production Ideas

Equipment, Methods and Services



Band Machine Handles Large, Awkward Pieces

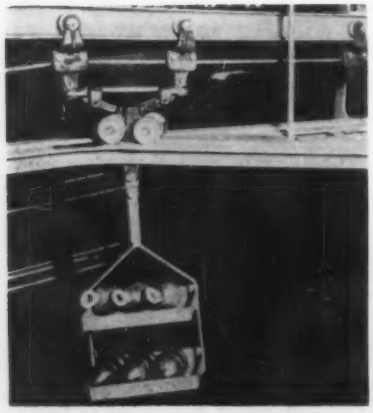
An oversize table on this vertical band machine lets it handle large, awkward workpieces. Previously available only on its maker's extra heavy-duty machines, the long travel tables now come on all models, including lower-price and high-speed ones. Tables have a 41-in. effective working stroke. They move a 1-ton workpiece at any feed rate from 1.5 to 96 ipm. Eight split ball-linear bearings of the 40 x 44-in. table roll smoothly on accurately aligned, hardened and ground rod-type ways. Table is hydraulically powered. Return rate is up to 144 ipm. All new machines using this table change saws without disturbing the setup. Total travel of the table is 9 in. more than effective working travel. At any time the table can be withdrawn to its extreme position. This leaves room for changing blades. (The DoAll Co.)

For more data circle No. 48 on postcard, p. 101

Throw-away Tool Boasts Universal Positioning

Universal positioning of carbide throw-away inserts is provided by this toolholder. Fitting most turning and shaping setups, it does away with need for several fixed angle holders in different sizes. In addition it speeds jobs by eliminating changing of holders from right to left or straight during a sequence of operations. Indexing the insert doesn't require taking the holder from the machine. The setup man merely loosens the cap assembly, indexes the carbide and retightens the cap. The holder remains on center of the workpiece. It consists of a rugged forged steel shank, anvil and clamping cap assembly; cap screw has a nylon locking insert. Sizes now available fit all standard tool posts, square turrets or toolholders. (Maxwell Industries, Inc.)

For more data circle No. 49 on postcard, p. 101



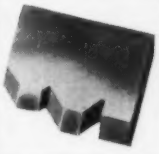
Overhead Conveyors Are Extremely Flexible

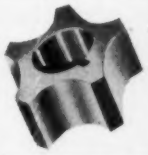
Trolleys travel from one power conveyor to another via this overhead system. Or the operator can switch trolleys to a free gravity setup. He can transfer conveyor trolleys at will through any processing operation and pick them up again at its completion. Not only can he put them onto a free gravity system, but he can switch them to another power route for dipping, heating or similar jobs. The multiple switching provides extreme flexibility, making conveyors adaptable to fabricating or assembly setups, or multiple area storage. Free trolleys travel on a lower track supported from the monorail; they run via gravity until the operator switches them to a power system. Transfer is by a simple mechanical switch, manually, hydraulically or air operated. (Dearborn Cable-Link Conveyor Div.)

For more data circle No. 50 on postcard, p. 101

BALLS & SEATS FOR CHECK VALVES

COMPRESSOR SLEEVES & RINGS



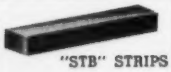


SPECIAL SHAPES

1000, 2000, 3000, 4000, 5000 & 6000 STYLES "H" & "P" STYLES

"RT" STYLE

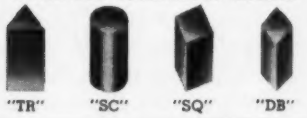
"RTT" STYLE



"STB" STRIPS

ROD STOCK

KLAMP-LOK TOOLHOLDER INSERTS



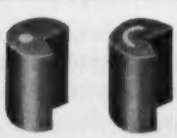
"TR" "SC" "SQ" "DB"

THROW-AWAY INSERTS FOR KLAMP-LOK HOLDERS

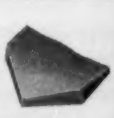
"MB" BLANK

TWIST DRILL BLANK

HELICAL BLANK

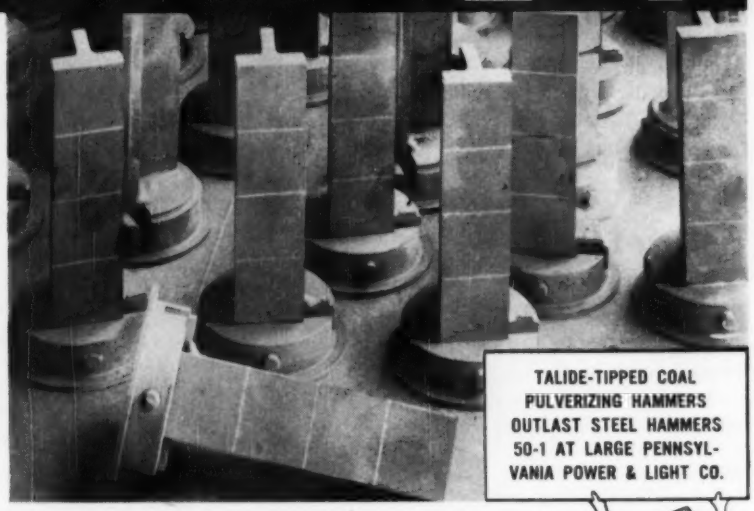


GUN DRILL BLANKS



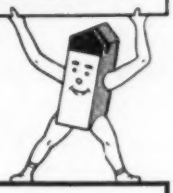
"TD" BLANK

Outlasts Steel 50 to 1!



TALIDE-TIPPED COAL PULVERIZING HAMMERS OUTLAST STEEL HAMMERS 50-1 AT LARGE PENNSYLVANIA POWER & LIGHT CO.

• TALIDE METAL, a tungsten carbide of superior quality, is harder, stronger, and more resistant to abrasion than any other metal. Properly applied, it gives superior service on applications where wear, heat, strain and shock are destructive to other metals.



- **ABRASION RESISTANCE**—Up to 100 times that of steel.
- **COMPRESSIVE STRENGTH**—Higher than all melted, cast or forged metals and alloys.
- **RESISTANCE TO DEFORMATION**—2 to 3 times greater than steel.
- **HEAT RESISTANCE**—Resists oxidation and thermal shock up to 1500°F.
- **THERMAL EXPANSION**—Less than half the rate of steel, "creep" is negligible.
- **FRICTIONAL RESISTANCE**—Lower than steel, non-galling, "slippery" properties higher.

• TALIDE METAL is saving industry millions of dollars annually by wear-proofing vital parts on machine tools, presses, pumps, compressors and other types of processing equipment used in the steel, oil, chemical, plastic, auto, rubber, textile, glass, mining and metalworking industry. The physical properties of the most commonly used grades are listed below. Other grades are available for specialized applications.

PHYSICAL PROPERTIES OF TALIDE METAL (P. S. I.)

Application	Operation	Talide Grade	Rockwell "A" Hardness	Specific Gravity (Density)	Transverse Rupture Strength	Compressive Strength	Co-Efficient of Thermal Expansion	Modulus of Elasticity (Deflection)
WEAR SURFACE	No Shock	C-91	91.8	14.90	235,000	710,000	3.00x10-6	91,000,000
	Light Shock	C-99	91.0	14.75	265,000	670,000	3.65x10-6	84,000,000
	Medium Shock	C-88	89.5	14.55	295,000	635,000	4.00x10-6	80,000,000
IMPACT	Light	C-85	88.4	14.25	315,000	600,000	3.75x10-6	77,000,000
	Medium	C-80	87.0	13.85	335,000	550,000	4.50x10-6	74,000,000
	Heavy	C-75	85.0	13.15	355,000	500,000	5.00x10-6	70,000,000

Note: Hardness values may vary plus or minus .2 to .3 on individual lots.

Metal Carbides Corporation Youngstown 12, Ohio

Send for Catalog 56-G

METAL CARBIDES CORPORATION

MC TALIDE®

YOUNGSTOWN 12, OHIO

HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

Closed-circuit TV

Automatic new closed-circuit television cameras automatically adjust to changing light levels. They use a regulated target voltage to maintain a uniform output-signal level over light changes greater than 150 to 1. (Closed-Circuit TV Dept., General Electric Co.)

For more data circle No. 51 on postcard, p. 101

Honing Tool

For use without a special machine, a new honing tool sets up on a lathe, drill press or grinder. It handles work in the range of 1/10 to 2¾ in. Stones are available in various sizes and grades (M. Dudgeon Co.)

For more data circle No. 52 on postcard, p. 101

Horizontal Grinders

Lightweight, powerful horizontal grinders handle a wide range of operations. They do jobs such as grinding, buffing and wire wheel work. Designed for handling ease, they can reduce operator fatigue in many metal removing or finishing operations. Various sizes and models are available. Speeds range from

3100 to 12,000 rpm. Wheel sizes are 3- to 8-in. diam. Lever, straight, or grip-type handles can be specified. (Thomas C. Wilson, Inc.)

For more data circle No. 53 on postcard, p. 101

Vacuum Cleaner

Using a standard 55-gal drum, a new portable rolls smoothly around the shop on a strong, silent dolly. If you wish you can use your own 55-gal drum, or you can get one with the cleaner. A two-

speed blower-suction unit does the cleaning. The two-speed unit easily dismounts for use as a hand or shoulder blower-suction cleaner. (Clements Mfg. Co.)

For more data circle No. 54 on postcard, p. 101

Materials Handler

A new rubber-tired, 4-wheel-drive materials handler has a load capacity of 9000 lb at average travel speeds. It comes in gas or diesel power units. Bucket sizes run from 1½ to 5 cu yd, SAE rated bucket sizes. The unit's "low-profile" front shroud gives the operator improved visibility. Breakout force is 21,000 lb. Bucket tip-back is 44° at ground level. (Frank G. Hough Co.)

For more data circle No. 55 on postcard, p. 101

Fastener Tool

This double action pneumatic-hydraulic tool installs high strength blind fasteners. It handles fasteners of stainless steel, "exotic" metal and other high alloy materials. The tool operates on line air at 90 psi. It

develops up to 3000-lb pull forces through a mechanism which converts air pressure to hydraulic power. It's not available for general marketing and use, its manufacturer points out. (Huck Mfg. Co.)

For more data circle No. 56 on postcard, p. 101

Automatic Lathes

Incorporating a pre-selector system into a company's lathes lets operators "dial" setup changes. It reduces setup time; therefore, it's particularly desirable with short runs. Both rough and finish passes are integrally controlled; this permits automatic sequencing from "rough" to "finish" passes without need for removing the work piece from between centers. (Seneca Falls Machine Co.)

For more data circle No. 57 on postcard, p. 101

QUANTITY PRODUCTION OF GREY IRON CASTINGS

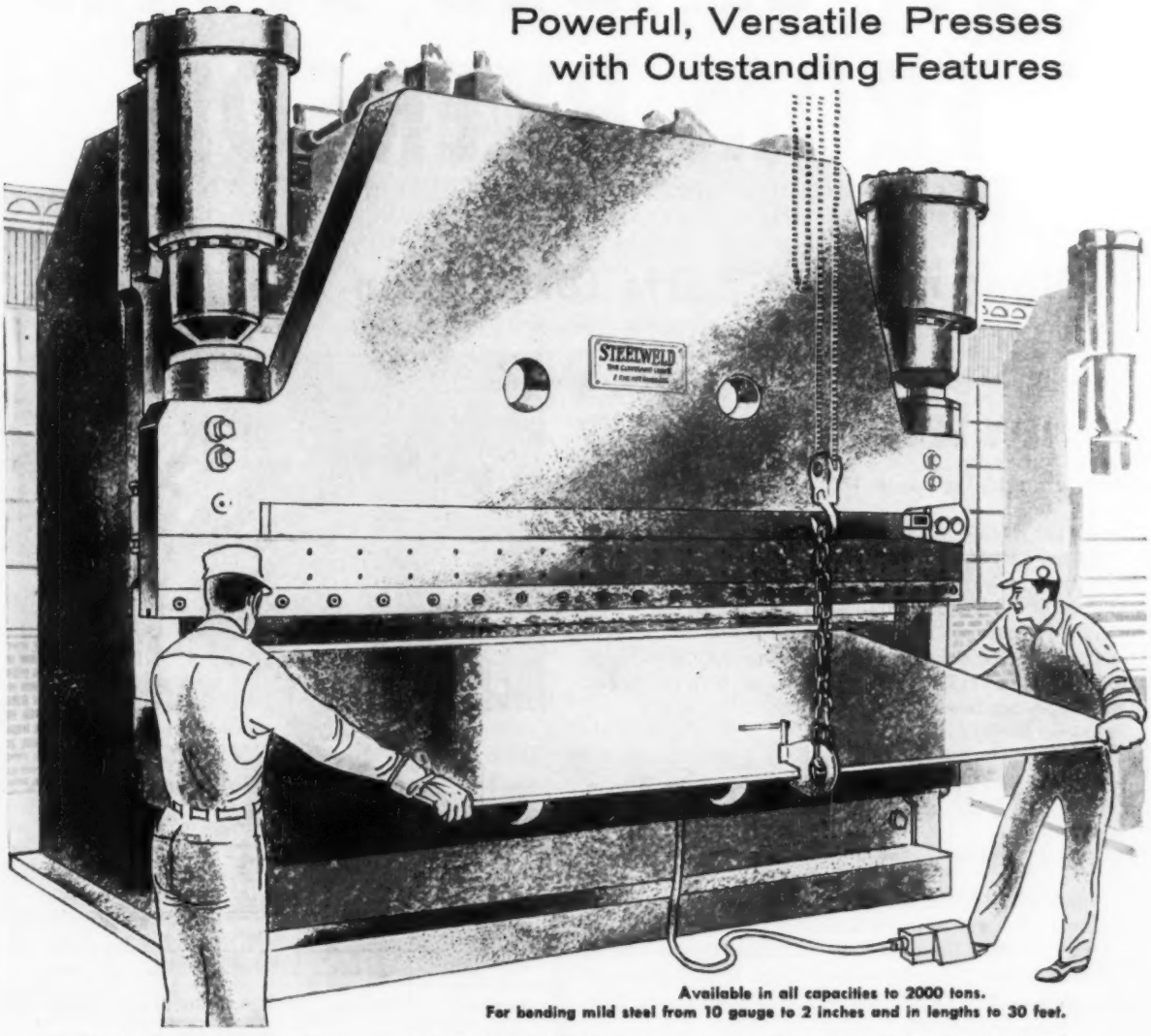
ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

STEELWELD

HYDRAULIC PRESS BRAKES

Powerful, Versatile Presses with Outstanding Features



Available in all capacities to 2000 tons.
For bending mild steel from 10 gauge to 2 inches and in lengths to 30 feet.

- **Positive overload protection.**
- **Constant power during entire stroke.**
- **Ram reversible at any point.**
- **Stroke quickly adjusted for any length.**
- **Fast ram approach and return—slow-speed pressing.**
- **Operating pressure simply adjusted.**
- **Accurate ram level automatically maintained.**
- **Ram easily tapered.**
- **Simple, safe to operate.**

HEAVILY built and of finest quality throughout, Steelweld Hydraulic Press Brakes are of the most advanced design with all features desirable for ease of operation, maximum production and finest performance.

They are versatile machines capable of handling a wide variety of operations. They are ideal for jobbing shops, as well as for mass-production work. They work to close tolerances and have ample speed.

We urge you to get the facts on these outstanding brakes that have so much to offer you.

Write for free copy of catalog No. 2024A.

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Hydraulic Shears; Mechanical Shears and Press Brakes; One-Two- and Four-point Straight-Side Presses; Hi-Draw Presses.

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NEW LEADED STEELS FROM RYERSON

Now, machine parts faster than ever before

NEW LEDLOY 170 TUBING

average machining speed 170 surface feet per minute

Here's the fastest-machining steel tubing ever produced —and only Ryerson has it available for immediate shipment from stock. Ledloy® 170 is a cold drawn, seamless product of low carbon analysis with .15% to .35% lead added. It promises a minimum increase of 25% in productivity of machined parts or components. Sizes range from 1" to 2½" O.D. with maximum ⅜" wall thickness. Other sizes can be supplied promptly.

Part produced from Ledloy 170 Tubing for machining-comparison at National Metal Show.

NEW LEDLOY 375 BARS

average machining speed 375 surface feet per minute

This newest addition to Ryerson free-machining screw steel stocks is the world's fastest-machining steel. Assigning the figure 100 to B-1112 and using this as a base, Ledloy 375 has a machinability index of 205 plus. It rates about 64% higher than B-1113 and about 20% higher than Ledloy 300.

Ledloy 375 bars presently in Ryerson stocks include rounds in sizes from ¼" to 1", hexagons ¼" to ⅝".

Ask your Ryerson representative for complete details on these new steels. And call Ryerson for an unequaled selection of cold finished bars and tubing, including the largest stocks of Ledloy 300 (also known as Ledloy A) and Rycut® leaded alloys—the fastest machining in their carbon ranges.

MACHINING COMPARISON*
Ledloy 170 Tubing vs. Nonleaded Tubing

	Ledloy 170		MT-1015	
	Speeds	Feeds	Speeds	Feeds
Center drill	172 s.f.m.	.005"	110 s.f.m.	.005"
Form tool	172 s.f.m.	.0008"	110 s.f.m.	.0008"
Boring tool	172 s.f.m.	.007"	110 s.f.m.	.007"
Cutoff	172 s.f.m.	.0013"	110 s.f.m.	.0013"
Thread	27 s.f.m.	—	20 s.f.m.	—
Tap	18 s.f.m.	—	12 s.f.m.	—
Production time	35 seconds		49 seconds	

* As demonstrated at National Metal Show, Cleveland, 1958.

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The Iron Age Summary

Steel Inventory Buildup Lags

Users are taking their time about rebuilding stocks despite strike danger.

Industry observers feel it may be too little too late for some if strike comes.

■ Steel users are taking their time about rebuilding inventories despite the danger of a steel strike this summer.

According to preliminary studies, steel users began the year with their stocks at a nine-year low. Despite expectations, there was no inventory buildup during the fourth quarter of 1958. Users added 500,000 tons in October, but they liquidated a like amount in November. December was a standoff.

Too Little Too Late?—A small inventory buildup is looked for in January. But considering the rate of incoming orders and the rise in steel use, the outlook now is that it will be March before there is any real addition to stocks.

Some industry observers feel the inventory additions may be too little too late for many steel users if there is a steel strike.

Said one marketing expert:

"If the auto industry holds at anywhere near its present production levels, this thing has got to develop into a real mess for the mills and their customers."

Sheets Show Strength — Cold-rolled sheet demand is so strong in the Chicago area that mills there are informally allocating sheets to their customers. One Cleveland mill also is allocating sheets for delivery during the first quarter. The market probably will tighten even more during April, May, and June.

Other tight products are galvanized sheets and terne plate (used to make auto gas tanks). Heavy plates are on allocation by one mill in the Midwest. Demand for tinplate for canmaking is better. Linepipe and oil country goods are picking up. Hot-rolled bars have improved. Structurals are showing signs of life.

Oil Country Buying Again—Demand for seamless pipe from oil companies is better than it has been for many months.

Even allowing for the low starting point, recent gains in demand for oil country seamless are striking. The backlog of one mill has jumped five times in the last 30 days. January shipments are running 50 pct over December's. The increases are due mostly to customer orders rather than rebuilding of mill warehouse stocks.

Wire Business Improves — Wire mills report a better tone to their market. In one area, at least, they are beginning to warn customers they'd better check their inventories. The mills suspect there will be a rush of orders in February and March that will extend deliveries sharply.

Scrap Firms Up—The improving demand for steel is a shot-in-the-arm to the scrap market. Scrap prices have firmed in most areas and appear to be heading upward.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,137	2,094	2,038	1,538
Ingot Index				
(1947-1949=100)	133.1	130.4	126.9	95.7
Operating Rates				
Chicago	80.0	79.0*	86.0	58.0
Pittsburgh	71.5	70.5*	71.5	54.0
Philadelphia	72.0	71.0*	73.5	62.0
Valley	68.0	71.0*	57.5	47.0
West	84.0	80.0*	84.0	72.0
Cleveland	86.0	81.0*	75.0	49.5
Buffalo	63.5	66.0	66.0	54.0
Detroit	96.0	97.0*	87.0	55.0
South	70.5	71.0	67.0	58.0
South Ohio River	86.0	82.0*	82.0	64.0
Upper Ohio River	85.5	86.0	87.0	58.0
St. Louis	88.0	90.0*	90.5	67.0
Aggregate	75.5	74.0	75.5	57.0

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	$66.41	$66.41	$66.41	$66.42
Scrap, No. 1 hvy (Gross ton)	$40.50	$40.17	$39.83	$33.17
No. 2 bundles	$29.00	$29.33	$29.00	$25.17
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	28.10
Copper, electrolytic	29.00	29.00	29.00	25.00
Lead, St. Louis	12.80	12.80	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	99.125	98.25	99.125	93.50
Zinc, E. St. Louis	11.50	11.50	11.50	10.00

Furnace Price Advance Expected

Builders of industrial furnaces and ovens are wooing buyers with advanced equipment for better heat treating.

But they say price increases this year are probable.

■ If you're planning to buy new heat treating equipment the time to act is now.

Although sales are improving the market is still very competitive. Builders are vying to give customers better furnaces, ovens, and induction heating units at today's prices. But price hikes are probably on the way.

Majority View—Three-fourths of the furnace makers surveyed agree price increases are due during 1959.

The reason: Rising material and labor costs. Advances of from 3 to 5 pct are expected.

All but a few of the manufacturers questioned agree that sales are moving up. About two-thirds of them believe 1959 orders will be better than those of 1958. And virtually all say current deliveries are good.

Delivery Run-Down—These delivery estimates are quoted on specific products: Standard furnaces, 4-16 weeks; specialized furnaces, 14 to 24 weeks; steel mill furnaces, 24 to 60 weeks; atmosphere furnaces, 10 to 16 weeks; and temperature control equipment, stock to 10 weeks.

New Approach—As a group furnace buyers are discarding some old purchasing ideas. They no longer tell equipment builders the type and size of furnace they need. Instead they rely on the engineering and design talent of the manufacturers.

Usually the furnace makers can suggest a better, faster, and improved method of heating. And everyone is satisfied. The buyer gets quality heat treating equipment to keep him ahead of his competition. The builder feels he's doing his full job. And everyone benefits when better furnaces turn out better work.

This greater reliance on the furnace manufacturer will increase in 1959. And because more buyers are replacing and modernizing heat treating equipment the manufacturers are out to fill these needs.

They are concentrating on furnaces built for greater efficiency and increased quality. And while doing it they are looking ahead to still greater developments.

What's Ahead — Here's what some of the manufacturers predict for the future:

"New materials will permit high temperature heat treatment at low maintenance costs. . . Use of prepared atmospheres will continue to increase for controlled atmosphere furnaces. . . Automated equipment will have a great impact."

"There's rising interest in vacuum treating furnaces for the new alloys and for special brazing applications needed in the electronic, aircraft, and missile fields."

"Because of the need of metals and alloys to withstand higher operating temperatures, there are many requests today for furnaces having operating temperatures up to 400°F. The demand for these furnaces is great and we are emphasizing their development."

"The heat treating of plate and structural shapes will get more attention."

MODERNIZATION: Gear maker has up-graded heat treating facilities by installing pit-type, nitriding furnaces from Leeds & Northrup Co.

MUNDT

PERFORATED METALS

The few perforations illustrated are indicative of the wide variety of our line—we can *perforate almost any size perforation in any kind of metal or material required.* Send us your specifications.

Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

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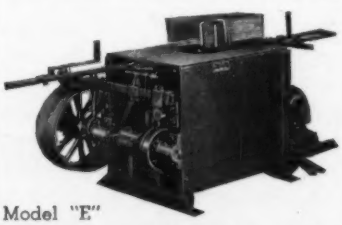
This bender is the result of our 30 years' experience in the manufacture of reinforcing bar benders. One man can easily bend 300 four bend stirrups an hour. This bender is also a very practical bender for light slab bars and miscellaneous bending. Write for catalog of our complete line of reinforcing bar benders.



Model "E"

KARDONG BROTHERS, INC.
MINNEAPOLIS 13, MINN.

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another fine product by
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Demand Improves For Most Products

Signs that the steel market is tightening are not difficult to find.

Sheet is still leading the way but other items are also picking up sales speed.

■ Demand for most steel products is moving up.

Reports on the sheet market, especially from the Midwest, are full of words like "allocation," "quota," and "tighter supply." Coated products, such as galvanized and aluminized sheet, have been in the runaway class for months.

But other parts of the market are also feeling the upturn. Tinplate shipments are running above December levels. Structural shapes are more active. For the first time in about a year sales of oil country seamless pipe are showing real strength. Standard pipe jobbers are busy building stocks against expected demand in the second quarter. Even plate buyers are taking more interest in buying.

Yet with all this activity steel producers still believe many users are over-cautious. "A lot of our customers are thinking about increasing orders," says one mill sales official, "but they haven't done anything about it yet."

"It's difficult to convince a buyer he should stock up," says an East Coast plate salesman, "when he can still get shipment in a few weeks."

So mills go on urging customers to review their needs in terms of a tightening market. And many consumers hesitate, reassured by still-favorable delivery schedules.

Stainless Prices—More mills have raised the price of stainless bars, billets, and wire about 3¾ pct. They include: Armco Steel Corp., Allegheny Ludlum Steel Corp., and Carpenter Steel Co.

While making these increases Allegheny Ludlum also announced some price reductions. Effective Jan. 7, A-L lowered its price on "certain premium-grade low alloy steels used mainly in missiles" 11 to 14 pct. Slight reductions on two grades of stainless sheet and strip were also made. Grade 304-L is now 62¾¢ a lb and 316-L is now 88½¢ a lb.

Sheet and Strip — Demand for cold-rolled sheet in **Midwest** markets is leading to a supply pinch. Some **Cleveland** area mills have placed narrower widths of cold-rolled on a quota basis. However, hot-rolled sheet is still in easy supply in that area.

At **Chicago,** where sheet has been tightening for several months, another mill has gone on informal allocation. Out-of-the-area producers are now feeling the full impact of the **Chicago** demand. They are busy shipping in sheet from points farther east. Strip deliveries are also moving out at **Chicago.** Some consumers who usually buy slit sheet have switched to mill-rolled strip for faster delivery.

It's a different story for **Pittsburgh** and **East Coast** mills. **Pittsburgh** producers are still accepting January orders for sheet and strip. Buyers seem in little hurry to place advance tonnages.

Acting through a broker, the Russians have purchased 20,000 tons of cold-rolled sheet from Republic Steel Corp (See story on p. 50.)

Plates and Shapes—Plate demand remains strong in **Chicago,** especially for the wider sizes. Narrower width product is still fairly easy to obtain from out-of-the-area mills Elsewhere plate is still relatively quiet. **East Coast** mills are quoting plate for delivery in 3-5 weeks. A buying boost is expected, however, in late first quarter or early second quarter.

Midwest mills say structural sales are picking up at a slow but steady rate. Previously shapes had been one of the quieter products, there.

Bar—More bar consumers are now building inventories. As a result bar mills, on an average, are operating about 75 pct of capacity. January output is generally 25 pct above December levels. And February tonnage figures are expected to equal or top January. Automotive bar buyers are more active, but other users are also helping sales.

Wire Products—Mills expect first quarter production will be about 10 pct better than last quarter '58. Manufacturer's wire is strong, with auto orders leading the buying parade. However, other users—including cold headers, furniture builders, fastener producers, and welding rod makers—are also contributing.

Pipe and Tubing—Sales of oil country seamless are steadily gaining strength. The backlog of one **Pittsburgh** mill has jumped five times in the past 30 days.

PURCHASING AGENT'S CHECKLIST

Oxygen steelmaking—a big factor in recent capacity boost—will be even more important in years to come. **P. 44**

New uses for zinc could push demand above supply. Producers encouraged about markets. **P. 48**

Vertical turret lathe uses punched tape control system. **P. 65**

COMPARISON OF PRICES

(Effective Jan. 13, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Jan. 13 1959	Jan. 6 1959	Dec. 16 1958	Jan. 14 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stain'l's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	45.00	45.00	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$77.50
Slabs, rerolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloy blooms, billets, slabs	119.00	119.00	119.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	5.967¢

	Jan. 13 1959	Jan. 6 1959	Dec. 16 1958	Jan. 14 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.51
Foundry, Southern Cin'ti	73.87	73.87	73.87	71.65
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.01
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.42
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.50	$43.50	$42.50	$32.50
No. 1 steel, Phila. area	35.50	34.50	33.50	36.50
No. 1 steel, Chicago	42.50	42.50	43.50	30.50
No. 1 bundles, Detroit	36.50	36.50	35.50	21.50
Low phos., Youngstown	46.00	45.50	44.50	35.50
No. 1 mach'y cast, Pittsburgh	50.50	50.50	50.50	49.50
No. 1 mach'y cast, Phila.	48.50	48.50	48.50	47.50
No. 1 mach'y cast, Chicago	54.50	53.50	53.50	45.50
Steel Scrap Composites: (per gross ton)				
No. 1 hvy. melting scrap	$40.50	$40.17	$39.83	$33.17
No. 2 bundles	29.00	29.33	29.00	25.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50	$14.50	$14.50	$15.38
Foundry coke, prompt	$18-18.50	$18-18.50	$18-18.50	$17.50-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.00	29.00	29.00	25.00
Copper, Lake, Conn.	29.00	29.00	29.00	25.00
Tin, Straits, N. Y.	99.125	98.25	99.125	93.50
Zinc, East St. Louis	11.50	11.50	11.50	10.00
Lead, St. Louis	12.80	12.80	12.80	12.80
Aluminum, virgin ingot	26.80	26.80	26.80	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. • Revised.

Finished Steel Composite

Weighed index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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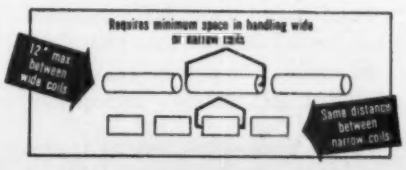

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Prices Inch Upward In Firm Market

The upturn in the scrap market is continuing, but rather slowly.

Dealers foresee higher prices but there are some offsetting factors.

■ The 1959 scrap market so far has been one of creeping optimism. Prices in most districts are stronger, but they are by no means running away.

Here and there a sale is made at a dollar or two better than the last price. Consumer inquiries are picking up and dealers in many markets are interpreting this as an omen of substantially higher prices in the near future.

A wave of resistance to current price levels may be in the making. So it is questionable how long the bubble will keep expanding. Mill purchases have been light and sporadic. There is still plenty of industrial scrap around and mills show a preference for those grades.

Another tempering factor is the abundance of low-priced scrap in the districts adjacent to the potential boom areas of Pittsburgh, the Ohio Valley, and Chicago. In several cases, mills in these major districts are drawing material from the East and South. In spite of freight costs, it is still economical for these mills to buy "outside."

However, one or two large orders by major consumers in the East or South could cut off this source of low-priced material overnight.

Based on light local buying and out-of-district sales, the price of primary openhearth scrap in Philadelphia rose $1, sending The IRON AGE No. 1 heavy melting Composite Price up 33¢ to $40.50.

Pittsburgh — Prices of most grades are unchanged. Signs of strength continue to appear. A late list showed No. 1 railroad heavy melting up $2 from last month. This compares with a $1 rise on earlier lists. Yards are balking at current prices for dealer grades. But there is still not enough open buying to translate the feeling of strength into higher prices.

Chicago—While the amount of new mill activity was not strong, speculative interest in scrap appears to be gaining. Some melting grades are affected and interest in turnings is growing. An increasing number of consumer inquiries is encouraging dealers to hold out for higher prices.

Philadelphia—Light tonnages of openhearth scrap were sold at prices $1 higher this week, with the exception of No. 2 bundles. Bundles went for $24.50, a $1 under the anticipated price quoted last week. Large quantities of scrap leaving the district by truck for Pittsburgh are forcing local mills to raise their buying prices. Low phos 5 ft and under was misquoted last week, as was low phos 2 ft and under. The correct prices were $40-$41 and $41-$42 respectively.

New York—New buying in this area has raised prices for No. 1 heavy melting $1 per ton. This is allegedly for export orders, but many dealers believe it is only to draw out material against anticipated local orders.

Detroit—The market is quiet but firm, with no new orders out. Dealers still expect demand to pick up in the coming weeks. Large tonnages of turnings overhang the market but draw no interest.

Cleveland—Market is up $1 based on new Valley purchases of dealer material. Dealers can readily find orders to ship against but are becoming reluctant to sell in hopes of a better price later. Several major mills have not come into the market for months and any big orders by them could push prices up substantially.

St. Louis—There is growing feeling of strength in this market. Dealers are filling old orders but are reluctant to accept new bids at current prices. Some weakness developed in cast grades, which are moving slowly.

Birmingham—Movement of scrap has increased since Jan. 1, but most customers indicated they have filled their needs for the month. It brought a $2 drop in price of primary openhearth grades, now at $33-$34.

Cincinnati—The market is firm but dealers are shipping only what they have to in hopes of a better price later on. Mills are taking what is offered them but not pushing for additional tonnages.

Buffalo—Only activity here was a cupola cast sale to the district's largest foundry at quoted prices. Low phos plate is up $1.

Boston — Prices are unchanged in a very quiet market.

West Coast—Prices for top steelmaking grades dropped in San Francisco and Los Angeles. Mills are buying only for their current needs. Flow of scrap is ample.

Houston—The local market is static. The district mill is not buying for the time being. Brokers are hopeful for greater export activity.

SCRAP PRICES *(Effective Jan. 13, 1959)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	43.00 to 44.00
No. 1 factory bundles	48.00 to 49.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. punch'gs plate	48.00 to 49.00
Heavy turnings	36.00 to 37.00
No. 1 RR hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	57.00 to 58.00
RR specialties	49.00 to 50.00
No. 1 machinery cast.	50.00 to 51.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	225.00 to 230.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	125.00 to 130.00
410 turnings	50.00 to 60.00

Chicago

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	36.00 to 38.00
No. 1 dealer bundles	43.00 to 44.00
No. 1 factory bundles	46.00 to 47.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Low phos. forge crops	52.00 to 53.00
Low phos. punch'gs plate	49.00 to 50.00
Low phos. 3 ft and under	47.00 to 48.00
No. 1 RR hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	52.00 to 53.00
Rerolling rails	63.00 to 64.00
Rails 2 ft and under	59.00 to 60.00
Angles and splice bars	54.00 to 55.00
RR steel car axles	71.00 to 72.00
RR couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	54.00 to 55.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	42.00 to 43.00
Cast iron wheels	43.00 to 44.00
Malleable	57.00 to 58.00
Stove plate	44.00 to 45.00
Steel car wheels	53.00 to 54.00
Stainless	
18-8 bundles and solids	215.00 to 220.00
18-8 turnings	125.00 to 130.00
430 bundles and solids	115.00 to 120.00
430 turnings	60.00 to 65.00

Philadelphia Area

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	23.50 to 24.50
No. 1 busheling	35.00 to 36.00
Machine shop turn.	17.00 to 19.00
Mixed bor. short turn.	18.00 to 20.00
Cast iron borings	18.00 to 20.00
Shoveling turnings	20.00 to 22.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	40.00 to 41.00
Low phos. 2 ft. punch'gs	41.00 to 42.00
Elec. furnace bundles	38.00 to 39.00
Heavy turnings	31.00 to 32.00
RR specialties	43.00 to 44.00
Rails 18 in. and under	57.00 to 58.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	44.00 to 45.00
Malleable	61.00 to 62.00
No. 1 machinery cast.	48.00 to 49.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	18.00 to 19.00
Low phos. 18 in. and under	47.00 to 48.00
Rails, random length	49.00 to 50.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	39.00 to 40.00
Drop broken cast.	47.00 to 48.00

Youngstown

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	44.00 to 45.00
No. 2 bundles	30.00 to 31.00
Machine shop turn.	19.50 to 20.50
Shoveling turnings	19.50 to 20.50
Low phos. plate	45.50 to 46.50

Cleveland

No. 1 hvy. melting	$40.50 to $41.50
No. 2 hvy. melting	32.50 to 33.50
No. 1 dealer bundles	40.50 to 41.50
No. 1 factory bundles	44.00 to 45.00
No. 2 bundles	26.50 to 27.50
No. 1 busheling	40.50 to 41.50
Machine shop turn.	15.50 to 16.50
Mixed bor. and turn.	20.50 to 21.50
Shoveling turnings	20.50 to 21.50
Cast iron borings	20.50 to 21.50
Cut structural & plates, 2 ft & under	47.00 to 48.00
Drop forge flashings	40.50 to 41.50
Low phos. punch'gs plate	41.50 to 42.50
Foundry steel, 2 ft & under	40.00 to 41.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Steel axle turnings	26.00 to 27.00
Railroad cast.	50.00 to 51.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	45.00 to 46.00
Malleable	61.00 to 62.00
Stainless	
18-8 bundles	215.00 to 220.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	15.00 to 16.00
Low phos. plate	40.00 to 41.00
Structurals and plate 2 ft and under	44.00 to 45.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	56.00 to 57.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

St. Louis

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	22.00 to 23.00
No. 1 RR hvy. melting	43.00 to 44.00
Rails, random lengths	47.00 to 48.00
Rails, 18 in. and under	52.00 to 53.00
Angles and splice bars	46.00 to 47.00
RR specialties	46.00 to 47.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	44.00 to 45.00
Cast iron car wheels	44.00 to 45.00
Rerolling rails	58.00 to 59.00
Unstripped motor blocks	39.00 to 40.00

Birmingham

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	37.00 to 38.00
Elec. furnace, 3 ft & under	34.00 to 35.00
Bar crops and plate	42.00 to 43.00
Structural and plate, 2 ft.	41.00 to 42.00
No. 1 RR hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	42.00 to 43.00
Rails, 18 in. and under	47.00 to 48.00
Angles and splice bars	42.00 to 43.00
Rerolling rails	56.00 to 57.00
No. 1 cupola cast.	53.00 to 54.00
Stove plate	53.00 to 54.00
Cast iron car wheels	41.00 to 42.00
Unstripped motor blocks	40.00 to 41.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	23.00 to 24.00
No. 2 dealer bundles	18.00 to 19.00
Machine shop turnings	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Clean chem. cast. borings	23.00 to 25.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	33.00 to 34.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	185.00 to 190.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	34.00 to 35.00
Drop forge flashings	33.00 to 34.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Heavy breakable cast.	33.00 to 34.00
Mixed cupola cast.	41.00 to 42.00
Automotive cast.	46.00 to 47.00
Stainless	
18-8 bundles and solids	205.00 to 210.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	105.00 to 110.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	24.00 to 25.00
No. 2 bundles	13.00 to 14.00
No. 1 busheling	24.00 to 25.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	17.00 to 19.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	31.00 to 32.00
Heavy breakable cast.	29.00 to 30.00
Stove plate	29.00 to 30.00

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	30.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 cupola cast.	45.00

Los Angeles

No. 1 hvy. melting	$36.00
No. 2 hvy. melting	34.00
No. 1 dealer bundles	33.00
No. 2 bundles	18.00
Machine shop turn.	15.00
Shoveling turnings	17.00
Cast iron borings	17.00
Elec. furn. 1 ft and under (foundry)	47.00
No. 1 cupola cast	47.00

Seattle

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.50
No. 2 hvy. melting	28.50
No. 1 dealer bundles	32.50
No. 2 bundles	23.00
Mixed steel scrap	24.50
Bush., new fact., prep'd.	32.50
Bush., new fact., unprep'd	26.50
Machine shop turn.	13.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	$39.00 to 41.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	30.00
No. 2 bundles	22.50
Machine shop turn.	15.00
Shoveling turnings	19.00
Cut structural plate 2 ft & under	$45.00 to 46.00
Unstripped motor blocks	31.00 to 32.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	26.50 to 27.50

Reynolds Owns Most Of U.K. Producer

Reynolds Metals Co. and its British partner now hold about 80 pct of British Aluminium, Ltd., stock.

This appears to cut out Alcoa's bid and gives Reynolds a firm foothold in Europe.

▪ The smoke is clearing in the battle for control for British Aluminium, Ltd. Reynolds Metals Co., and its British partner Tube Investments, Ltd., appear to be in position to claim a complete victory.

Their challenger: Aluminum Co. of America, which was seeking control by buying the large block of unissued shares.

Reynolds and TI have bought on the open market, and swapped for cash and TI stock an estimated 80 pct of outstanding British Aluminium stock.

Gains—The Reynolds win gives the company a firm foothold in European and Commonwealth markets. And in so doing it slams the door, at least temporarily, in the face of a formidable competitor.

Also, the BA facilities that Reynolds now controls definitely improves its world wide market position.

For instance, British Aluminium fabricating costs are conceded to be lower than in the U. S. They may even be low enough to let British mill shapes compete in the U. S. and South America as well as Europe.

More Capacity — Reynolds also gets control of a smelter in Canada. British Aluminium's plant at Baie Comeau, Canada, now has a capacity of 45,000 tons. This is likely to hit 90,000 tons in 1959-60. And the plant is set up so that capacity could easily be expanded to 160,000 tons. This ingot could be important if some potential tonnage markets in the U. S. switch to aluminum.

And to add icing to the cake, Reynolds gains entry to another low cost source of bauxite. British Aluminium is a partner with several other aluminum producers, including Ormet and the French company Pechiney in a major bauxite project in Africa.

Expansion—It looks like British Aluminium will get something it really needs—cash for expansion. Reynolds and Tube Investments have not spelled out their plans. But it is no secret that at a stockholders meeting in February Reynolds' directors will ask authority to issue one million shares of common stock, and a million of second class preferred.

Reynolds is saying nothing about what it would do with the cash from such a sale, probably because of strict SEC regulations. The trade is guessing much of the proceeds would go to British Aluminium.

The Picture — Here's how the whole thing came about:

Early in 1958 Reynolds Metals Co. started buying British Aluminium stock in quantity. They successfully masked their identity.

Then late last year British Aluminium directors in search of expansion funds agreed to let Alcoa buy the unissued stock over a period of time as BA needed the money.

This forced Reynolds and its partner Tube Investments into the open. They offered BA stockholders cash and Tube Investment stock.

The two deals clashed because if anyone bought the unissued stock it would dilute Reynolds-TI holdings below what they considered effective control.

Reynolds and TI increased their efforts and now appear to have enough control to block the Alcoa move.

Government

Interior Secretary Fred A. Seaton says the Administration has no plans for a minerals subsidy bill this session. He presented such a program to Congress last year and barely lost.

Mr. Seaton does not dismiss the possibility that some domestic metals producers may get government help, but says nothing is planned now.

On lead and zinc, the heart of his previous program, Mr. Seaton says the import quotas are firming domestic prices.

Tin prices for the week: Jan. 7—99.125; Jan. 8—99.00; Jan. 9—98.875; Jan. 12—99.125; Jan. 13—99.125.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum ingot	26.80	26.10	8/1/58
Copper (E)	29.00	27.50	10/23/58
Copper (CS)	29.00	29.50	11/26/58
Copper (L)	29.00	27.50	10/23/58
Lead, St. L.	12.60	12.30	10/14/58
Lead, N. Y.	13.00	12.50	10/14/58
Magnesium ingot	36.00	34.00	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/58
Titanium sponge	182-182	185-205	11/3/58
Zinc, E. St. L.	11.50	11.00	11/7/58
Zinc, N. Y.	12.00	11.50	11/7/58

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colbourne. Canada. ZINC: prime western. Tin: See above; Other primary prices, pg. 121.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136 .249	.250- 3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46 9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	42.7-44.2	51.1-54.5
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	⅝-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2 353	$2 823
.024 gage	1.762	2.349	2 937	3 524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.8
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	53.13	.....	50.36	53.32
Brass, Yellow	46.57	47.11	46.51	49.96
Brass, Low	49.23	49.77	49.17	52.54
Brass, R L	50.17	50.71	50.11	53.48
Brass, Naval	51.24	.....	45.05	54.65
Munts Metal	49.35	.....	44.66	.....
Comm. Bs.	51.65	52.19	51.59	54.71
Mang. Bs.	54.94	.....	48.64	.....
Phos. Bs. 5%	72.52	.....	73.09	.....

Free Cutting Brass Rod 31.22

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, $6.90-$7.40; alloy, $14.35; Plate, HR, commercially pure, $5.00-$5.75; alloy, $7.75-$8.50. Wire, rolled and/or drawn, commercially pure, $5.50-$6.00; alloy, $8.00-$9.50; Bar, HR or forged, commercially pure, $4.25-$4.65; alloy, $4.25-$7.15; billets, HR, commercially pure, $3.55-$4.10; alloy, $3.55-$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.45
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis... $ 1.31
Cobalt, 97-99% (per lb) ....$2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 35.00 to 42.00
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.....$70 to $80
Lithium, 98% .....$11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York .....$218 to $221
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz...$15 to $17
Platinum, dollars per troy oz...$50 to $55
Rhodium .....$120.00 to $125.00
Silver ingots (¢ per troy oz.) 90.125
Thorium, per kg. $43.00
Vanadium .....$ 3.45
Zirconium sponge .....$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 28.00
No. 120 ..... 27.00
No. 123 ..... 26.00
80-10-10 ingot
No. 305 ..... 32.25
No. 315 ..... 30.25
88-10-2 ingot
No. 210 ..... 39.75
No. 215 ..... 35.50
No. 245 ..... 32.25
Yellow ingot
No. 405 ..... 23.00
Manganese bronze
No. 421 ..... 24.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.75-25.00
0.60 copper max. 24.50-24.75
Piston alloys (No. 122 type)..24.25-25.25
No. 12 alum. (No. 2 grade)....21.50-22.00
108 alloy 22.00-23.50
195 alloy 25.00-26.00
13 alloy (0.60 copper max.)....24.25-24.75
AXS-679 (1 pct zinc) 21.75-22.25

(Effective Jan. 12, 1959)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 22.50-23.50
Grade 2—92-95% 21.25-22.25
Grade 3—90-92% 20.25-21.25
Grade 4—85-90% 17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	25	24¼
Yellow brass	19	17¼
Red brass	22⅛	21⅝
Comm. bronze	22⅝	22¼
Mang. bronze	17¾	16⅞
Free cutting rod ends	18¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 25¼
No. 2 copper wire 23¾
Light copper 21½
*Refinery brass 23¾
Copper bearing material 22½
* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 25¼
No. 2 copper wire 23¾
Light copper 21½
No. 1 composition 19
No. 1 comp. turnings 18½
Hvy. yellow brass solids 14¼
Brass pipe 15⅝
Radiators 15⅝

Aluminum

Mixed old cast. ..... 12 —13
Mixed new clips ..... 15 —16
Mixed turnings, dry ..... 13 —14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 21½—22
No. 2 copper wire ..... 19½—20
Light copper ..... 17½—18
Auto radiators (unsweated). 13¼—13⅜
No. 1 composition ..... 16½—17
No. 1 composition turnings.. 15½—16
Cocks and faucets ..... 13½—14
Clean heavy yellow brass ... 11⅝—12¼
Brass pipe ..... 13½—14
New soft brass clippings .... 14 —14½
No. 1 brass rod turnings .... 11½—12

Aluminum

Alum. pistons and struts .... 6 — 6½
Aluminum crankcases ..... 10 —10½
1100 (2S) aluminum clippings 13 —13½
Old sheet and utensils ..... 10 —10½
Borings and turnings ..... 6½— 7
Industrial castings ..... 10 —10½
2020 (24S) clippings ..... 11¼—11¾

Zinc

New zinc clippings ..... 4⅝— 5¼
Old zinc ..... 3½— 3¾
Zinc routings ..... 2¼— 2½
Old die cast scrap ..... 2 — 2¼

Nickel and Monel

Pure nickel clippings 52-54
Clean nickel turnings 37-40
Nickel anodes 52-54
Nickel rod ends 52-54
New Monel clippings 30-32
Clean Monel turnings 30-32
Old sheet Monel 26-28
Nickel silver clippings, mixed 18
Nickel silver turnings, mixed 15

Lead

Soft scrap lead ..... 8 — 8⅛
Battery plates (dry) ..... 2⅞— 3
Batteries, acid free ..... 2½— 2⅝

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixer common babbitt ..... 9½—10
Solder joints ..... 13¼—13¾
Siphon tops 42
Small foundry type ..... 10½—10⅝
Monotype ..... 10½—10⅝
Lino. and stereotype ..... 9½— 9⅝
Electrotype ..... 8½— 8⅝
Hand picked type shells .... 6½— 7
Lino. and stereo. dross ..... 2¾— 3
Electro dross ..... 2¼— 2⅓

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3, R3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*			5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1,* *C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *F3*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$113.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

(Effective Jan. 12, 1959)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 10.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75 lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A1*	6.275 *A1*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*	6.875 *G2*							$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *W5, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets.

(Effective Jan. 12, 1959)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.475 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	8.625 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				8.675 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6*	6.425 *B2*				8.675 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Jan. 12, 1959) * Special Quality.

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50								
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50								
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Fontana *K1*	+6.25		+2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50								
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

(Effective Jan. 12, 1959)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2

High-carbon chromium.. .955 D-3, D-5
Oil hardened manganese .505 O-2
Special carbon ..... .38 W-1
Extra carbon ..... .38 W-1
Regular carbon ..... .325 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	Plate (*L4, C4, A3, J2*) 15 pct	Plate (*L4, C4, A3, J2*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 42.05; 1 side, 35.55.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington *C16*	.....	6.50	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *P5*	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.50	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.50
Foundry, beehive (f.o.b.)	$18.00 to $18.50
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	33.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky....	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk...	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$109.00
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.75
Missouri Valley	15.00
Midwest	17.00

(Effective Jan. 12, 1959)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...		190	9.00	9.675
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4****	173	190	172	212	196	6.65	9.325
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.775
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**.	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.325
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.60	10.15
Rankin, Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50†
SparrowsPt. *B3***	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7.8*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
National Tube	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.25
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	41.00
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1–4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine				
½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	40½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1¼" and larger x all lengths	31	34	40	41
Rolled thread, ¼" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½
C. P. Hex, reg. & hvy.	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	41
Semi-finished Hex Nuts	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅞ in. and smaller	65

Rivets	*Base per 100 lb*
½ in. and larger	$12.85
	Pct. Off List
7/16 in. and smaller	15

Cap Screws	*Discount (Packages)*
	Full Finished H. C. Heat Treat
New std. hex head, packaged	Full Case
⅝" diam. and smaller x 6" and shorter	54
⅝", ¾", ⅞", and 1" diam. x 6" and shorter	38
⅝" diam. and smaller x longer than 6"	..
⅝", ¾", ⅞", and 1" diam. x longer than 6"	..

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

	Mach. Screws	Stove Bolts
Plain Finish	Discount	
Cartons	60	60
Bulk		
Quantity		
To ¼" diam. incl. 25,000-and over	60	..
5/16 to ½" diam. incl. 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Hex	Square
	Discount	
In Cartons	16	19
Quantity		
In Bulk ⅜" diam. & smaller 25,000-and over	15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 500 lb lots	42.25
Electrodeposited	33.25
Brass, 80-20, ball anodes, 2000 lb or more	46.50
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	17.50
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.45
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	22.15
Nickel salts, single, 100 lb bags	45.00
Nickel chloride, freight allowed, 100 lb	82.25
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.70
(Philadelphia price 24.15)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24*				
Baltimore	$.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.88
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99					
Boston	.10	9.41	10.50	12.07	9.84	10.12	10.11	10.21	13.45*	16.79	15.79	20.29	19.56
Buffalo	.15	8.40	9.75	11.00	8.90	9.35	9.40	9.30	11.60*	16.34	15.55	19.01	19.30
Chicago	.15	8.40	9.60	11.05	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati	.15	8.58	9.65	10.70	8.98	9.42	9.71	9.46	11.68*	16.52	15.52	20.02	19.27
Cleveland	.15	8.51	9.69	11.51	8.78	9.28	9.54	9.25	11.40*	16.31	15.31	19.81	19.06
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19				20.84
Detroit	.15	8.66	9.85	11.40	9.03	9.41	9.71	9.45	9.66	15.46	15.48	18.81	19.23
Houston		8.10	8.60		8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles		8.70[3]	11.20–11.80	12.20	9.15	9.10	9.00	9.10	12.95	17.30	16.35	21.30	20.60
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee	.15	8.54	9.73	11.19	8.80	9.18	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York	.10	8.97	10.23	11.20	9.74	9.87	9.84	10.09	13.35*	16.16	15.60	20.10	19.35
Norfolk	.20	8.20			8.90	8.65	9.20	8.90	10.70				
Philadelphia	.10	8.30	9.35	10.44	9.35	9.25	9.20	9.50	12.05*	16.58	15.58	20.08	19.33
Pittsburgh	.15	8.50–8.60	9.70–9.95	11.05	8.76	9.05	9.15	9.14	11.40*	16.20	15.20	19.70	18.95
Portland		10.00[1]	11.75[2]	13.30[3]	11.95[4]	11.50[5]	11.10[6]	9.85[7]	15.30*	18.50	17.45	20.75	20.25
San Francisco	.10	9.75	11.20	11.50	9.85	10.10	9.95	10.25	13.70	17.05	16.35	21.05	20.60
Seattle		9.95	11.55	12.45	10.00	9.70	9.80	10.10	14.70	17.15	16.80	20.65	20.60
Spokane	.15	10.10	11.70	12.60	10.65	9.85	9.95	10.75	14.85	17.75	16.95	21.55	20.75
St. Louis	.15	8.78	9.98	11.43	9.04	9.42	9.63	9.52	9.93	16.58	15.58	20.08	19.33
St. Paul	.15	8.94	10.19	11.64	8.99	9.45	9.53	9.70[7]	10.16		15.41		19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage.

†† 10¢ zinc. ‡ Deduct for country delivery. [1] C1018—1 in. rounds. [2] 10 ga. x 36" x 120"; [3] 20 ga. x 36" x 120"; [4] 26 ga. x 30" x 96"; [4] 4½" x 1" in lots of 1000 to 9999; [5] sheared plate ¼" x 84" in lots of 1000 to 9999; [6] 3" x 5.70" in lots of 1000 to 9999; [7] M-1020—1-in. rounds in lots of 1000 to 9999; [8] 15 ga. & heavier.

(Effective Jan. 12, 1959)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75c per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50c per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31 0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	30.25	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	32.75	36.50-37.75	37.25-38.75	38.00-39.50	41.00-42.50	40.50-42.00	62.25-64.50	47.00-48.75	55.75-57.75	28.25-29.25	28.25-29.25	28.75-29.75	28.75-29.75
Bars, struct.	42.00-43.50	43.00-44.50	44.25-46.00	45.00-46.75	48.00-49.75	47.75-49.50	73.00-75.75	55.50-57.50	64.75-67.25	33.75-35.00	33.75-35.00	34.25-35.50	34.25-35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	38.00	30.00	31.25-31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	40.00	40.75-42.25	42.00-43.50	42.75-44.25	45.50-47.25	45.25-47.00	69.25-71.75	52.75-54.50	61.50-63.75	32.00-33.25	32.00-33.25	32.50-33.75	32.50-33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); New Bedford, Mass., *R6;* Gary, *U1* (25¢ per lb. higher).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8.*

(Effective Jan. 12, 1959)

EXPLORE

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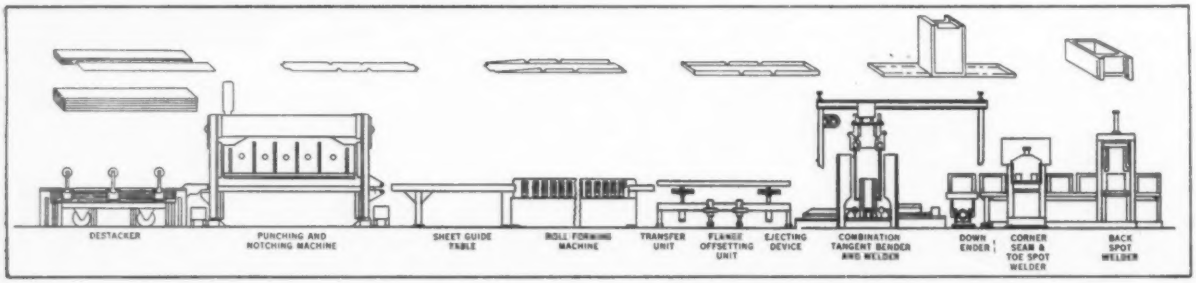

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STAMFORD
OAKVILLE AND WINDSOR, ONTARIO

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 28.25
0.025% C (Simplex) 36.75
8% max C, 50-55% Cr, 6% max Si. 25.75
4½% max C, 50-55% Cr, 2% max Si 26.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C	$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.15
Ton lots	1.17
Less ton lots	1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	28.25	14.60
Ton lots	33.50	16.05
Less ton lots	35.10	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads, bulk	24.00
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed. 16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads, bulk	23.00
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn (Bulk)	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Carloads, bulk, delivered, per lb of briquet	15.10
Briquets, packed pallets, 3000 lb up to carloads	16.30

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe..	24.95	23.65
98% Si, 1.0% Fe	24.45	23.15

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb..	2.40	3.30	4.55

(Effective Jan. 12, 1959)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	9.85¢
Ton lots	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 50-60% lb, 2 in. x D, delivered per pound contained Cb.

Ton lots	$3.90
Less ton lots.....	3.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed)	$1.46
Less ton lots (packed)	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

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(3) 2500-HP Westinghouse Motors 600-VDC, 160/320 R.P.M.

(1) 2200-HP Westinghouse Motor 600-VDC, 92/132 R.P.M.

(6) 1500-HP Westinghouse Motors 600-VDC, 600 R.P.M.

(2) 650-HP S.S. Motors, 300-VDC, 1000 R.P.M., encl. F.V.

(2) 600-HP Allis-Chalmers Motors 600-VDC, 300/600 R.P.M.

★ ★ ★ ★ ★ ★

(1) S. & S. 4-unit M-G Set consists of (1) 3200-HP syn. motor 11,000/2200-V. 3-P, 60 cy., (1) 1060-KW (2) 760-KW, 600-VDC generators, complete with exciters and motor starter.

(3) 3500-KW, 3-unit Allis-Chalmers M-G Sets (2) 1750-KW Gen., 350/700-VDC, (1) 5000-HP syn. motor 13,800/6900/4000-V.

(1) 1875-KW Whse. M-G Set, 250-VDC, 514 R.P.M. with 2700-HP syn motor 13,900/6900/4000-V.

★ ★ ★ ★ ★ ★

(1) 2500-HP Allis-Chalmers, mill type Slip Ring motor 300 RPM, 2200-V.

(1) 1800-HP Whse. Mill type slip ring motor, 252 R.P.M., 2300-V.

(2) 1500-HP G.E. slip ring motors, mill type, 450 R.P.M., 6600/4000-V.

T. B. MAC CABE COMPANY
4302 Clarissa St., Philadelphia 40, Penna.
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Phone: Davenport 4-8300

Used Machine Sales Dipped in November

Latest reports from dealers' association show sales dropped 5 pct below October.

But November business was still way above levels for that month in '57.

▪ Nationwide sales of used machinery during November were 17 pct above the same period in 1957, according to the Machinery Dealers National Assn.

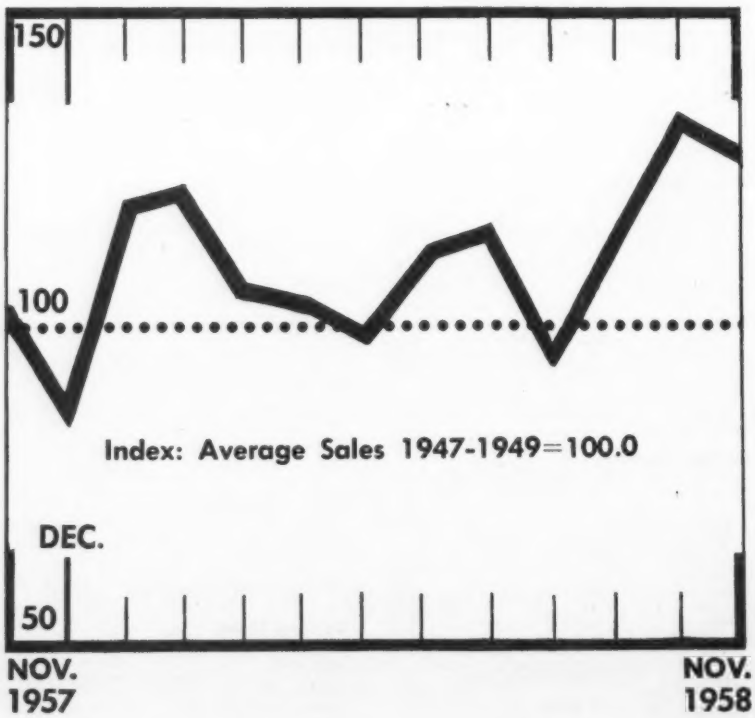
Despite this, the MDNA reports, sales last November dropped 5 pct from the level of the preceding month. (See chart below.) But there was a small decrease (1.9 pct) in the number of used tools in dealers' stock.

Yet, even with this decrease, the dollar value of these inventories rose 3.4 pct. There was also an increase (7.7 pct) in the number of tools invoiced to buyers at $200 or more each.

The slight overall decline in November sales reflects the generally lighter activity of the pre-holiday period, MDNA officials believe.

"It looks as though December totals will show not only a recovery from this slight drop, but the beginning of a new rise," says R. K. Vinson, executive director of the MDNA.

Used Machine Tool Sales



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8 ton P&H	55' Span 230/3/60
10 ton P&H	50' Span 230 Volt D.C.
10 ton P&H	39' Span 230 Volt D.C.
10 ton Milwauke	57' Span 230 Volt D.C.
10 ton Shaw	48' Span 230 Volt D.C.
10 ton Whiting	75' Span 220/3/60 A.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton P&H	50' Span 230 Volt D.C.
15 ton Northern	54' Span 230 Volt D.C.
15 ton Shepard Niles	56' Span 230 Volt D.C.
15 ton N-B-P	100' Span 220/3/60 A.C.
120 ton Shepard Niles	77' Span 230/3/60

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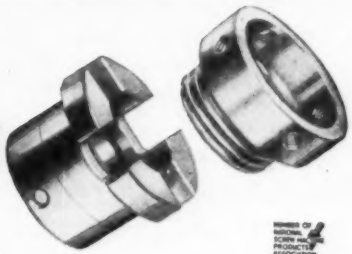

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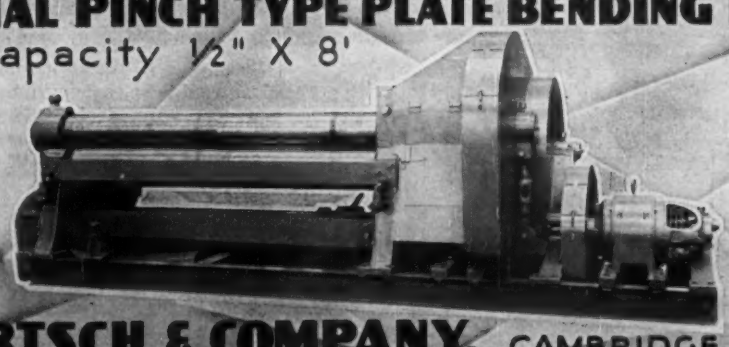

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JUNE 19

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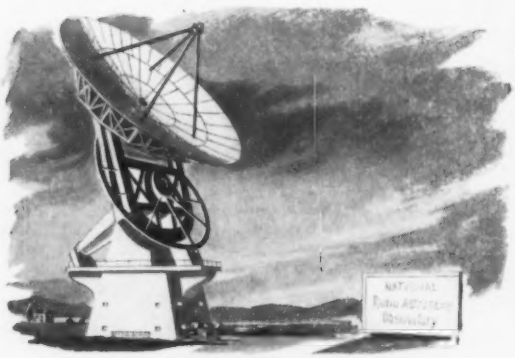
Pilot rams F-80 into Bliss over-run barrier in successful test of installation at Air National Guard Field, Van Nuys, Calif. Bliss conceived, built, tested and installed this barrier and is working on other military and commercial applications.

AUGUST 21



SCANS OUTER SPACE

National Science Foundation awards Bliss complete "turn-key" responsibility for building world's most powerful radio telescope at Green Bank, West Virginia.

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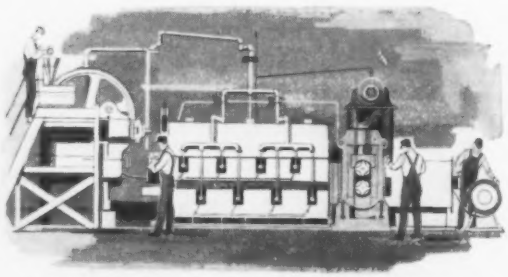

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